RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Solid Waste Management Units
40 (RAAP-009) and 71 (RAAP-002)
RCRA Facility Investigation/
Corrective Measures Study Report

VOLUME II

FINAL
APRIL 2009

PREPARED BY:

URS

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APPENDIX C

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APPENDIX C.1

PHYSICAL SOIL SAMPLE RESULTS

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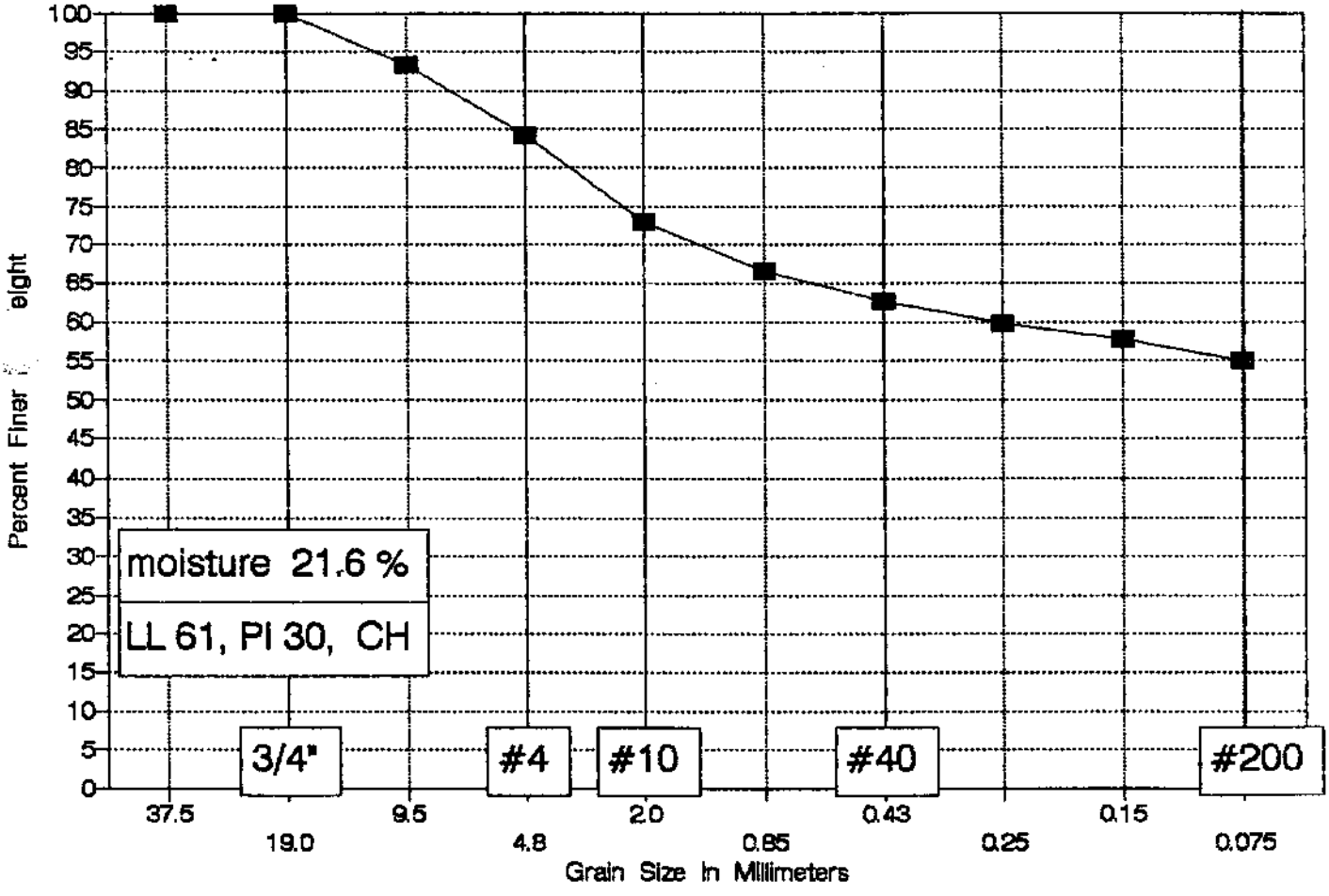
GRADATION CURVE

Boring 40 MW 1, sample at 0-2 feet



RAAP RFI
Usathama
Virginia

Boring 40 MW 1
Sample at 0-2 feet

Wt soil and dish	198.1
Dry soil & dish	182.3
Dish	109.2

Moisture Content = 21.6

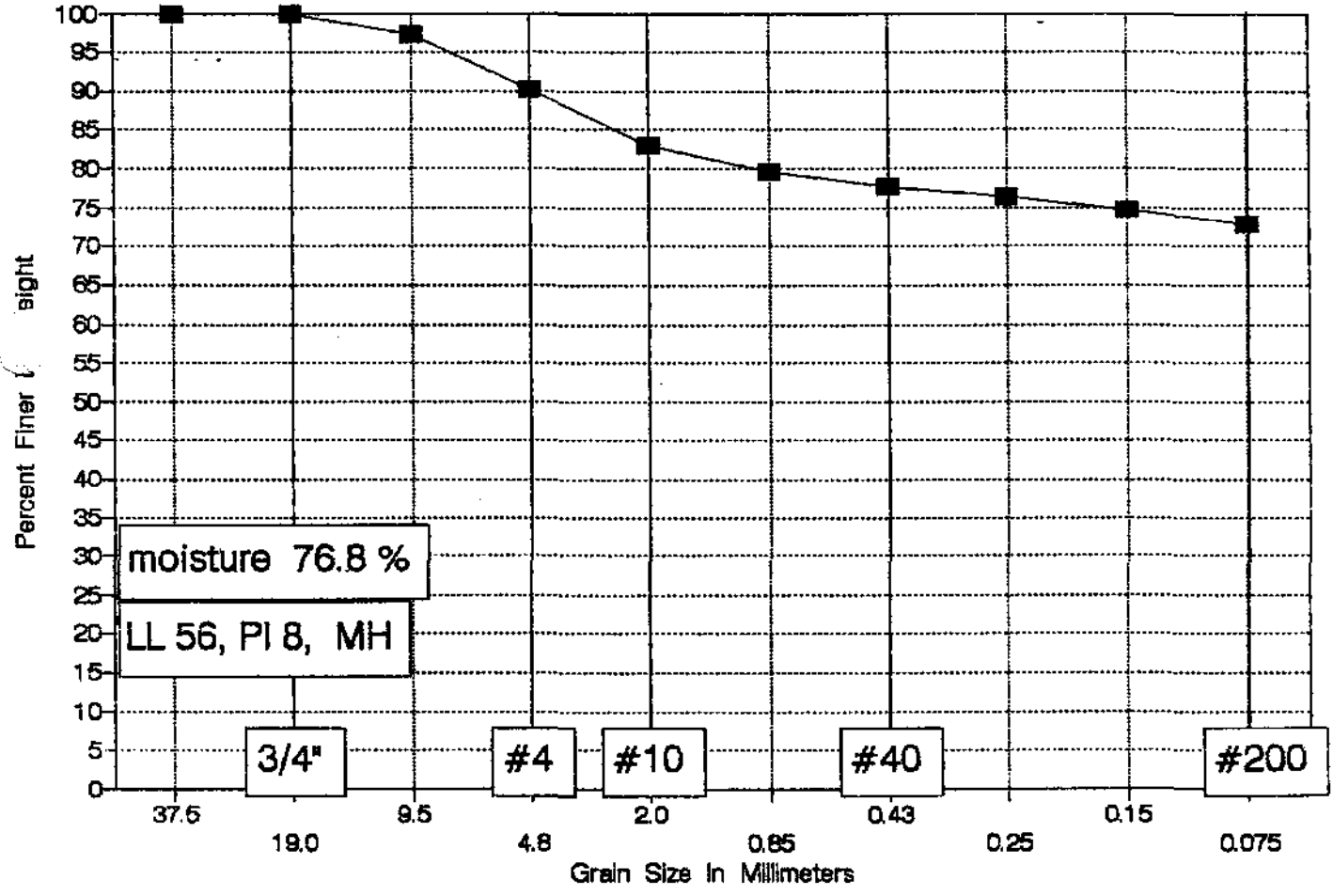
SIEVE ANALYSIS

Dry weight of total sample= 73.1

Sieve #	weight retained	% Finer		
1.5 inch	0	100.00%	100.0	37.5
3/4 inch	0	100.00%	100.0	19.0
3/8 inch	4.8	93.43%	93.4	9.5
# 4	11.5	84.27%	84.3	4.8
# 10	19.7	73.05%	73.1	2.0
# 20	24.5	66.48%	66.5	0.85
# 40	27.4	62.52%	62.5	0.43
# 60	29.4	59.78%	59.8	0.25
# 100	30.9	57.73%	57.7	0.15
# 200	33	54.86%	54.9	0.075

GRADATION CURVE

Boring 40 MW 2, sample at 10-12 feet



RAAP RFI
Usathama
Virginia

Boring 40 MW 2
Sample at 10-12 feet

Wt soil and dish	215.9
Dry soil & dish	170.5
Dish	111.4

Moisture Content = 76.8

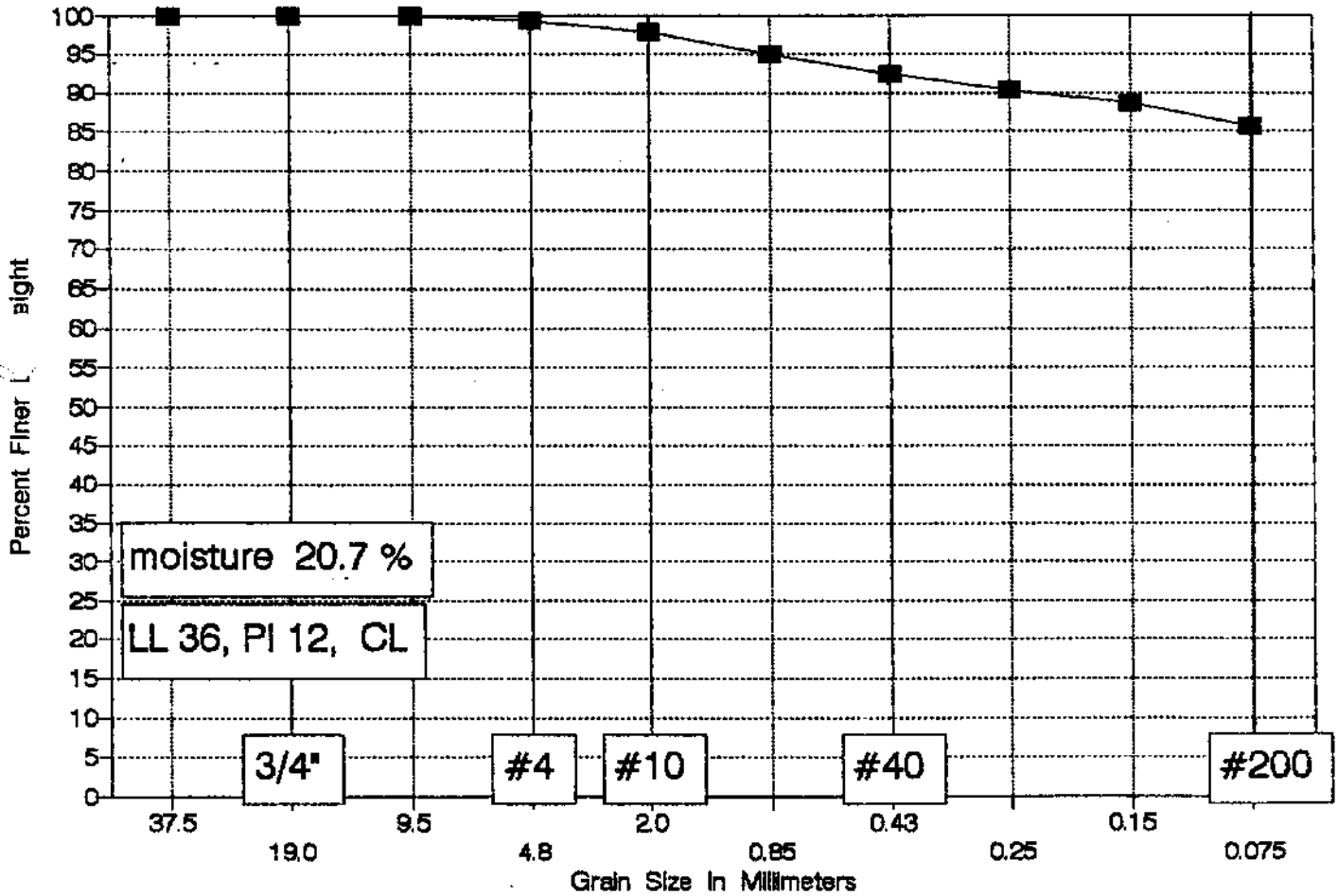
SIEVE ANALYSIS

Dry weight of total sample= 59.1

Sieve #	weight retained	% Finer		
1.5 inch	0	100.00%	100.0	37.5
3/4 inch	0	100.00%	100.0	19.0
3/8 inch	1.6	97.29%	97.3	9.5
# 4	5.8	90.19%	90.2	4.8
# 10	10.1	82.91%	82.9	2.0
# 20	12.1	79.53%	79.5	0.85
# 40	13.2	77.66%	77.7	0.43
# 60	14	76.31%	76.3	0.25
# 100	14.9	74.79%	74.8	0.15
# 200	16	72.93%	72.9	0.075

GRADATION CURVE

Boring 40 MW 3, sample at 0-2 feet



RAAP RFI
Usathama
Virginia

Boring 40 MW 3
Sample at 0-2 feet

Wt soil and dish	240.5
Dry soil & dish	217.4
Dish	105.8

Moisture Content = 20.7

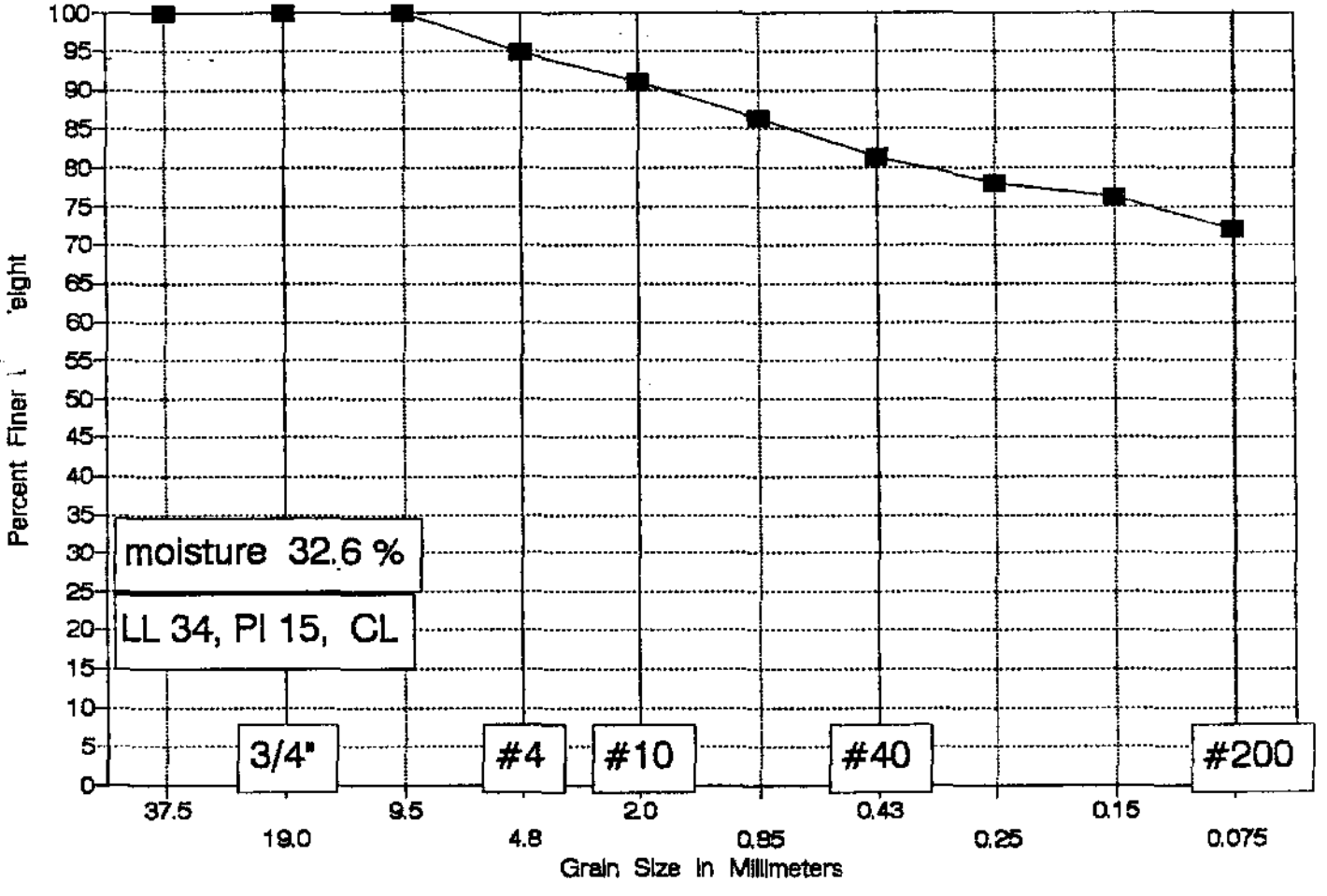
SIEVE ANALYSIS

Dry weight of total sample= 111.6

Sieve #	weight retained	% Finer		
1.5 inch	0	100.00%	100.0	37.5
3/4 inch	0	100.00%	100.0	19.0
3/8 inch	0	100.00%	100.0	9.5
# 4	0.7	99.37%	99.4	4.8
# 10	2.3	97.94%	97.9	2.0
# 20	5.6	94.98%	95.0	0.85
# 40	8.4	92.47%	92.5	0.43
# 60	10.8	90.32%	90.3	0.25
# 100	12.6	88.71%	88.7	0.15
# 200	15.9	85.75%	85.8	0.075

GRADATION CURVE

Boring 40 MW 3, sample at 38-49 feet



RAAP RFI
Usathama
Virginia

	Wt soil and dish	202.5
Boring 40 MW 3	Dry soil & dish	180.1
Sample at 38-49 feet	Dish	111.4

Moisture Content = 32.6

SIEVE ANALYSIS

Dry weight of total sample= 68.7

Sieve #	weight retained	% Finer		
1.5 inch	0	100.00%	100.0	37.5
3/4 inch	0	100.00%	100.0	19.0
3/8 inch	0	100.00%	100.0	9.5
# 4	3.5	94.91%	94.9	4.8
# 10	6.1	91.12%	91.1	2.0
# 20	9.4	86.32%	86.3	0.85
# 40	12.7	81.51%	81.5	0.43
# 60	15	78.17%	78.2	0.25
# 100	16.4	76.13%	76.1	0.15
# 200	19.1	72.20%	72.2	0.075

AAP RFI
Osathama
Virginia

		Wt soil and dish	190.4
Boring	40 MW 4	Dry soil & dish	161.4
Sample at 5-7 feet		Dish	108.3

Moisture Content = 54.6

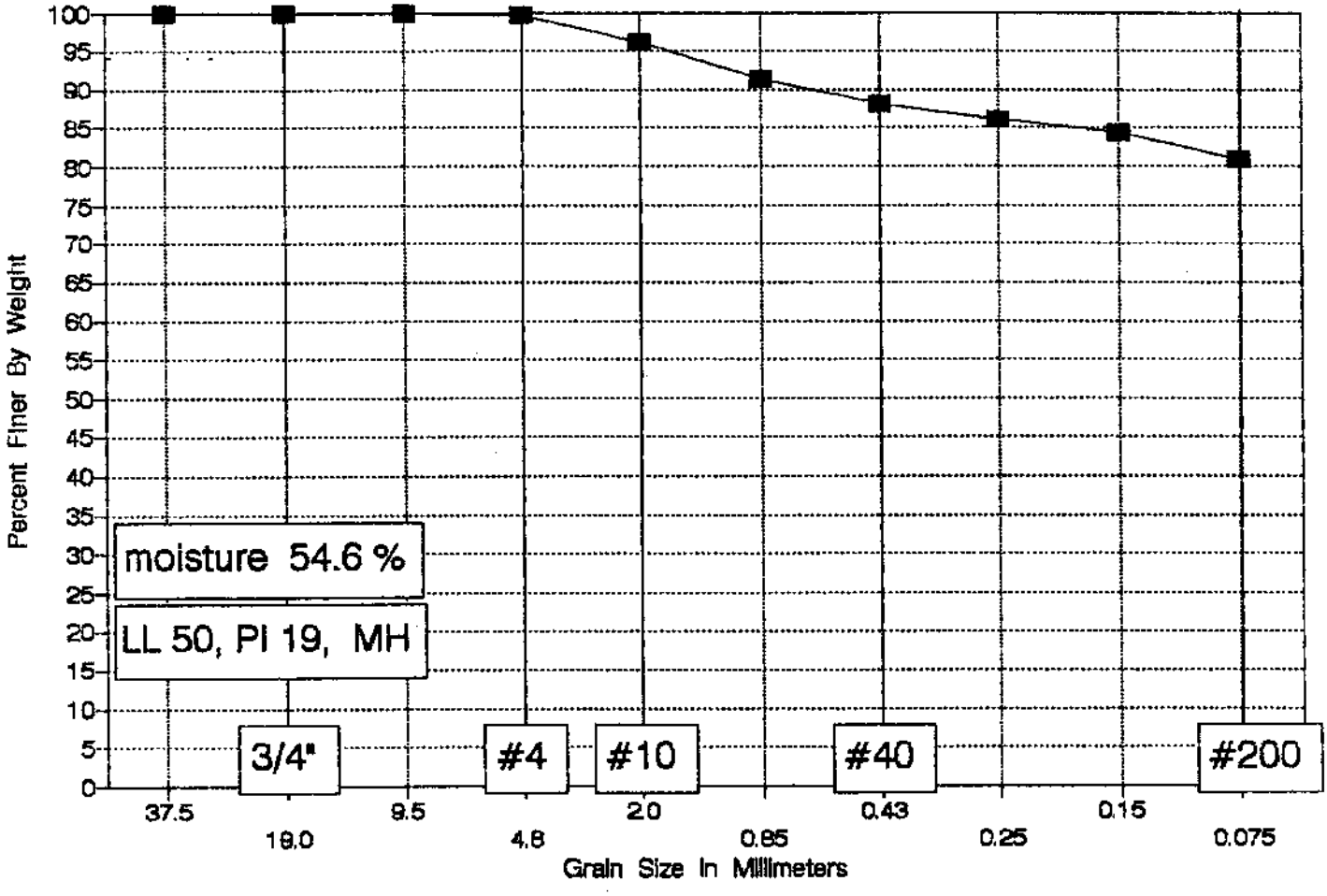
SIEVE ANALYSIS

Dry weight of total sample= 53.1

Sieve #	weight retained	% Finer		
1.5 inch	0	100.00%	100.0	37.5
3/4 inch	0	100.00%	100.0	19.0
3/8 inch	0	100.00%	100.0	9.5
# 4	0.1	99.81%	99.8	4.8
# 10	2	96.23%	96.2	2.0
# 20	4.6	91.34%	91.3	0.85
# 40	6.3	88.14%	88.1	0.43
# 60	7.4	86.06%	86.1	0.25
# 100	8.3	84.37%	84.4	0.15
# 200	10.2	80.79%	80.8	0.075

GRADATION CURVE

Boring 40 MW 4, sample at 5-7 feet

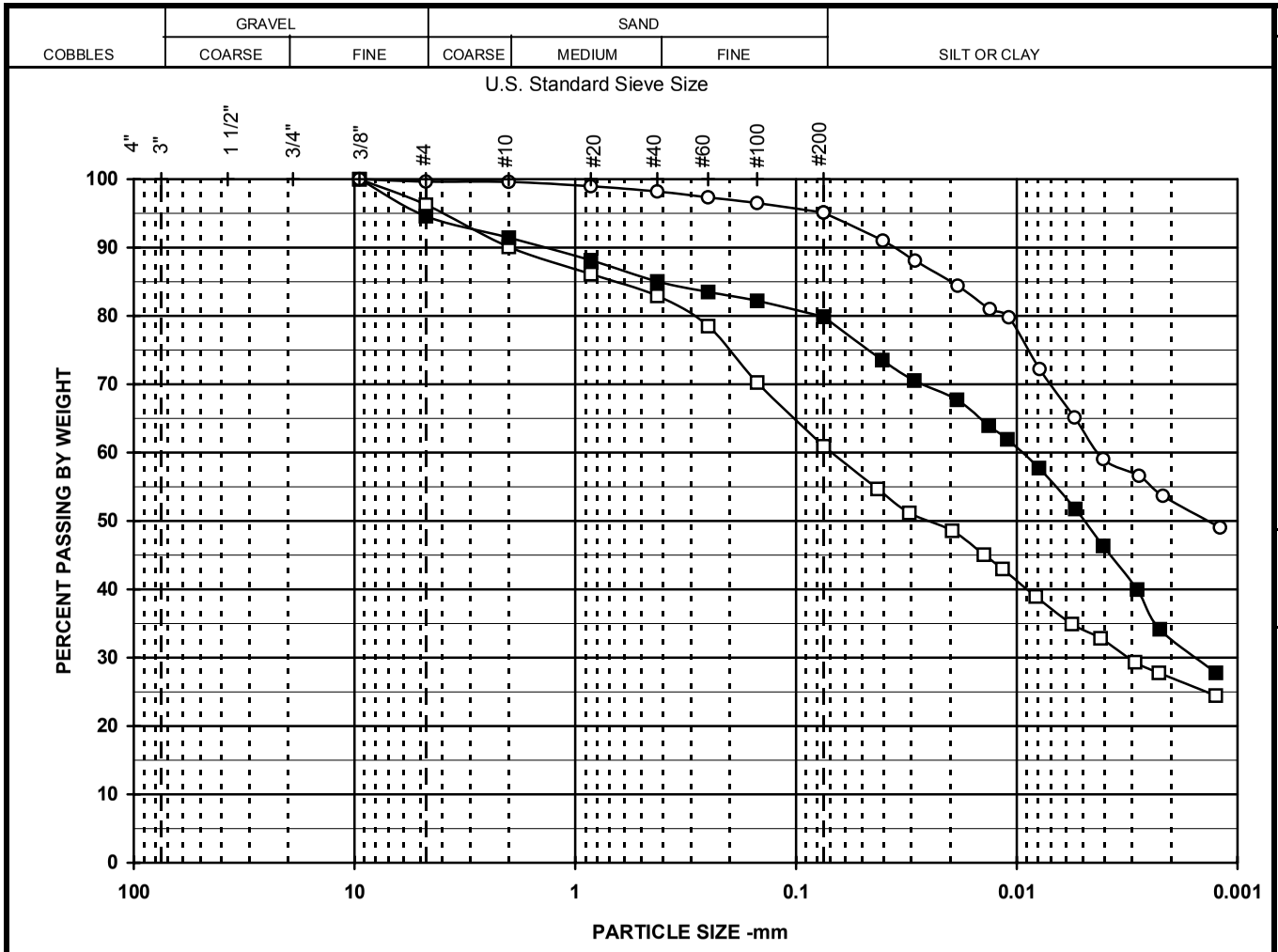


Radford Army Ammunition Plant SWMU 40/71 RCRA Facility Investigation

LABORATORY TESTING DATA SUMMARY

BORING	SAMPLE	DEPTH	D2216	D4318			USCS	D422		D4972		D2974	D854	D2937		D5084	CALCULATED POROSITY		
			WATER	LIQUID	PLASTIC	PLAS.		SIEVE	HYDRO.	pH		ORGANIC	SOIL	TOTAL	DRY	HYDRAULIC	TOTAL	AIR-FILLED	WATER-FILLED
NO.	DATE		CONTENT	LIMIT	LIMIT	IND.	SYMB.	MINUS NO. 200	% MINUS 2 μm	Distilled Water	0.01 M CaCl Solution	CONTENT (burnoff)	PARTICLE DENSITY	BULK DENSITY	BULK DENSITY	CONDUCTIVITY	SOIL POROSITY	SOIL POROSITY	SOIL POROSITY
		(ft)	(%)					(%)	(%)			(%)	(-)	(pcf)	(pcf)	(cm/sec)	(-)	(-)	(-)
40SB4	2/19/03	0-4	18.1	35	13	22	CL	60.9	27	6.8	6.6	5.5	2.687	129.0	109.2	6.6E-8	0.35	0.02	0.33
40SB4	2/19/03	32	41.0	50	23	27	CH	79.9	33	6.5	6.4	3.0	2.691	114.9	81.4	8.5E-8	0.52	0.00	0.52
40SB9	2/19/03	0-4	19.4	30	14	16	CL	*(2)	*(2)	8.8	7.5	2.8	2.692	131.9	110.5	2.7E-9	0.34	0.00	0.34
71SB11	2/19/03	3+	32.1	55	23	32	CH	95.1	53	6.6	6.4	4.1	2.685	117.2	88.7	1.1E-7	0.47	0.01	0.46

Note: (1) USCS symbol based on visual observation and Atterberg limits reported.
(2) Not enough sample for testing.



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

Symbol	□	■	○
Boring	40SB4	40SB4	71SB11
Sample			
Spec			
Depth	0-4	32	3+
% +3"			
% Gravel	3.7	5.4	0.3
% SAND	35.4	14.7	4.6
% FINES	60.9	79.9	95.1
% -2μ	27	33	53
Cc			
Cu			
LL	35	50	55
PL	13	23	23
PI	22	27	32
USCS	CL	CH	CH
w (%)			

Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"			
3/4"			
3/8"	100.0	100.0	100.0
4	96.3	94.6	99.7
10	90.1	91.5	99.6
20	86.1	88.1	99.0
40	82.9	85.0	98.2
60	78.5	83.5	97.3
100	70.3	82.2	96.5
200	60.9	79.9	95.1

PARTICLE SIZE DISTRIBUTION

Radford Army Ammunition Plant

Project No.		Figure
9604-258	March 2003	

URS Corporation

Radford Army Ammunition Plant SWMU 40/71 RCRA Facility

SUMMARY OF LABORATORY PERMEABILITY TESTS

BORING NO.	DEPTH	WATER CONTENTS	TOTAL UNIT WGTS	DRY UNIT WGTS	STRESSES	DURING CONSOL.	DURING TEST	COEFFICIENT OF PERM. K, (@ 20 C)	REMARKS
		INITIAL	INITIAL	INITIAL	EFFECTIVE	TIME	PERMEANT		
		PRE-TEST	PRE-TEST	PRE-TEST	BACK PRESSURE	VOLUMETRIC STRAIN	INITIAL GRADIENT		
	(ft)	(%)	(pcf)	(pcf)	(psi)	(days, %)		(cm/sec)	
40SB4	0-4	18.1	129.0	109.2	5.0	over night	tap water	6.6E-8	P6554
		19.6	131.4	109.9	100.0	0.6	20		
40SB4	32+	41.0	114.9	81.4	5.0	over night	tap water	8.5E-8	P6555
		38.0	114.6	83.0	100.0	1.9	21		
40SB9	0-4	19.4	131.9	110.5	5.0	over night	tap water	2.7E-9	P6552
		18.8	132.6	111.6	100.0	1.0	22		
71SB11	3+	32.1	117.2	88.7	5.0	over night	tap water	1.1E-7	P6553
		33.4	117.9	88.4	100.0	-0.4	24		

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 9604-258 BORING: 40SB4 Test No.: P6554

Project Name: Radford Army Ammunition Plant SAMPLE: DEPTH (ft): 0-4

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

Preliminary Length/Area Calculations

Lo =	2.333	in	Lo=	5.926	cm
dLc=	0.010	in	Ao =	11.99	cm^2
Lc=	2.323	in	Vo =	71.03	cm^3
			Lc=	5.901	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	0.91	cm^3
			Vc =	70.12	cm^3
Sc =	0.497	cm^{-1}	Ac=	11.883	cm^2

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

Equations Used

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

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

K @ 20 ºC = RT * Kt TubeC= 1.316

Consol Stage-Trial No.	Temp. ° C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20ºC cm/sec Dev. from Ave.
initial	21.6	2/21/03	09	38	00	105.0	100.0	58.28	49.60	1.01	6.94E-08
final	21.7	2/21/03	11	47	00			56.88	50.04		6.65E-08
1	RT = 0.964	dT =	129.00 min			σ'_c =	0.7 ksf	0.105	0.104	io= 18.5	1%
initial	21.7	2/21/03	11	48	00	105.0	100.0	59.08	49.36	1.03	7.06E-08
final	21.3	2/21/03	13	31	00			57.78	49.76		6.78E-08
2	RT = 0.968	dT =	103.00 min			σ'_c =	0.7 ksf	0.098	0.095	io= 20.7	3%
initial	21.3	2/21/03	13	32	00	105.0	100.0	59.19	49.33	0.97	6.65E-08
final	21.2	2/21/03	14	59	00			58.12	49.68		6.43E-08
3	RT = 0.974	dT =	87.00 min			σ'_c =	0.7 ksf	0.080	0.083	io= 21.0	-3%
initial	21.2	2/21/03	15	02	00	105.0	100.0	59.40	49.26	0.97	6.76E-08
final	21.2	2/21/03	16	36	00			58.20	49.65		6.55E-08
4	RT = 0.975	dT =	94.00 min			σ'_c =	0.7 ksf	0.090	0.093	io= 21.6	-1%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	5.901	cm	ε_{axial} =	0.4%
Ac =	11.965	cm^2		
Vc=	70.60	cm^3	ε_{vol} =	0.6%
Sc =	0.493	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	18.07	129.0	109.2	90.6
PreTest	19.59	131.4	109.9	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 ºC: **6.60E-08** cm/sec

(i_o)ave = 20.5

Tested By: DT Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 9604-258 BORING: 40SB4 Test No.: P6555

Project Name: Radford Army Ammunition Plant SAMPLE: DEPTH (ft): 32+

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

Preliminary Length/Area Calculations

Lo = 2.339 in Lo= 5.942 cm

dLc= 0.006 in Ao = 12.11 cm^2

Lc= 2.333 in Vo = 71.93 cm^3

Lc= 5.926 cm

dVc = 3 Vo * (dLc/Lo) dVc= 0.55 cm^3

Vc = 71.38 cm^3

Sc = 0.492 cm^{-1} Ac= 12.045 cm^2

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

Equations Used

Kt = - 0.0000773 * Sc/dT(min) * ln (ho/hf)

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

K @ 20 ºC = RT * Kt TubeC= 1.3133

Consol Stage-Trial No.	Temp. ° C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20ºC cm/sec Dev. from Ave.
initial	21.6	2/21/03	09	39	00	105.0	100.0	56.11	46.70	0.99	8.68E-08
final	22.0	2/21/03	11	09	00			54.78	47.12		8.43E-08
1	RT = 0.960	dT =		90.00 min		σ'_c =	0.7 ksf	0.102	0.103	io= 20.0	0%
initial	22.0	2/21/03	11	10	00	105.0	100.0	56.20	46.68	1.00	8.70E-08
final	21.7	2/21/03	12	59	00			54.60	47.18		8.45E-08
2	RT = 0.959	dT =		109.00 min		σ'_c =	0.7 ksf	0.123	0.122	io= 20.2	0%
initial	21.7	2/21/03	13	00	00	105.0	100.0	56.40	46.60	1.01	8.55E-08
final	21.3	2/21/03	14	04	00			55.40	46.91		8.37E-08
3	RT = 0.968	dT =		64.00 min		σ'_c =	0.7 ksf	0.077	0.076	io= 20.8	-1%
initial	21.3	2/21/03	14	05	00	105.0	100.0	56.61	46.53	1.01	8.68E-08
final	21.2	2/21/03	15	41	00			55.10	47.00		8.55E-08
4	RT = 0.974	dT =		96.00 min		σ'_c =	0.7 ksf	0.116	0.115	io= 21.4	1%
initial											
final											
5											
initial											
final											
6											

TEST SUMMARY

Final Specimen and Test Conditions

Lc = 5.926 cm ε_{axial} = 0.3%

Ac = 11.905 cm^2

Vc= 70.55 cm^3 ε_{vol} = 1.9%

Sc = 0.498 cm^{-1} Sc = Lc / Ac , final

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	41.04	114.9	81.4	103.9
PreTest	38.03	114.6	83.0	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 ºC: **8.45E-08** cm/sec

(i_o)ave = 20.6

Tested By: DT Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 9604-258 BORING: 40SB9 Test No.: P6552

Project Name: Radford Army Ammunition Plant SAMPLE: 2/19/03 DEPTH (ft): 0-4

Specimen - Apparatus set-up - Test Information Cell No. 5 Apparatus No. 1 Stage No.: 2

Preliminary Length/Area Calculations

Lo =	2.535	in	Lo=	6.439	cm
dLc=	0.010	in	Ao =	11.59	cm^2
Lc=	2.525	in	Vo =	74.62	cm^3
			Lc=	6.414	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	0.88	cm^3
			Vc =	73.74	cm^3
Sc =	0.558	cm^{-1}	Ac=	11.496	cm^2

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

Equations Used

Kt = - 0.0000760 * Sc/dT(min) * ln (ho/hf)

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

K @ 20 ºC = RT * Kt TubeC= 1.319

Consol Stage-Trial No.	Temp. ° C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20ºC cm/sec Dev. from Ave.
initial	21.6	2/21/03	09	36	00	105.0	100.0	52.70	42.43	0.91	4.09E-09
final	21.2	2/21/03	14	06	00			52.50	42.50		3.96E-09
1	RT = 0.970	dT =	270.00 min			σ'_c =	0.7 ksf	0.015	0.017	io= 20.1	47%
initial	21.2	2/21/03	14	06	00	105.0	100.0	52.50	42.50	0.80	2.79E-09
final	21.2	2/21/03	17	28	00			52.40	42.54		2.71E-09
2	RT = 0.975	dT =	202.00 min			σ'_c =	0.7 ksf	0.008	0.009	io= 19.6	1%
initial	21.2	2/21/03	17	31	00	105.0	100.0	54.09	42.04	0.72	2.26E-09
final	21.6	2/21/03	20	37	00			54.00	42.08		2.19E-09
3	RT = 0.970	dT =	186.00 min			σ'_c =	0.7 ksf	0.007	0.009	io= 23.6	-19%
initial	21.6	2/21/03	20	37	00	105.0	100.0	54.00	42.08	1.12	2.28E-09
final	22.0	2/24/03	09	33	00			52.39	42.54		2.18E-09
4	RT = 0.960	dT =	3656.00 min			σ'_c =	0.7 ksf	0.122	0.109	io= 23.4	-19%
initial	22.0	2/24/03	09	36	00	105.0	100.0	54.45	41.90	0.88	2.56E-09
final	22.4	2/24/03	16	04	00			54.23	41.98		2.43E-09
5	RT = 0.951	dT =	388.00 min			σ'_c =	0.7 ksf	0.017	0.019	io= 24.6	-10%
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	6.414	cm	ε_{axial} =	0.4%
Ac =	11.517	cm^2		
Vc=	73.87	cm^3	ε_{vol} =	1.0%
Sc =	0.557	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	19.36	131.9	110.5	100.1
PreTest	18.77	132.6	111.6	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 2-5

ave K @ 20 ºC: **2.69E-09** cm/sec

(i_o)ave = 22.3

Tested By: DT Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 9604-258 BORING: 71SB11 Test No.: P6553

Project Name: Radford Army Ammunition SAMPLE: DEPTH (ft): 3+

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

Preliminary Length/Area Calculations

Lo =	2.229	in	Lo=	5.661	cm
dLc=	0.009	in	Ao =	11.50	cm^2
Lc=	2.220	in	Vo =	65.10	cm^3
			Lc=	5.638	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	0.79	cm^3
			Vc =	64.31	cm^3
Sc =	0.494	cm^{-1}	Ac=	11.407	cm^2

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

Equations Used

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

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

K @ 20 ºC = RT * Kt TubeC= 1.322

Consol Stage-Trial No.	Temp. ° C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20ºC cm/sec Dev. from Ave.
initial	21.6	2/21/03	09	37	00	105.0	100.0	57.37	46.50	1.01	1.18E-07
final	21.9	2/21/03	10	44	00			55.80	47.00		1.11E-07
1	RT = 0.962	dT =	67.00 min			σ'_c =	0.7 ksf	0.118	0.116	io= 24.2	-2%
initial	21.9	2/21/03	10	46	00	105.0	100.0	57.50	46.40	0.97	1.23E-07
final	21.7	2/21/03	11	47	00			55.97	46.91		1.16E-07
2	RT = 0.960	dT =	61.00 min			σ'_c =	0.7 ksf	0.115	0.119	io= 24.8	2%
initial	21.7	2/21/03	11	48	00	105.0	100.0	57.10	46.56	0.99	1.17E-07
final	21.5	2/21/03	12	40	00			55.90	46.95		1.11E-07
3	RT = 0.965	dT =	52.00 min			σ'_c =	0.7 ksf	0.090	0.091	io= 23.5	-2%
initial	21.5	2/21/03	12	41	00	105.0	100.0	57.10	46.56	1.02	1.20E-07
final	21.2	2/21/03	13	58	00			55.35	47.11		1.14E-07
4	RT = 0.971	dT =	77.00 min			σ'_c =	0.7 ksf	0.131	0.128	io= 23.5	1%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	5.638	cm	ε_{axial} =	0.4%
Ac =	11.588	cm^2		
Vc=	65.33	cm^3	ε_{vol} =	-0.4%
Sc =	0.487	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	32.12	117.2	88.7	97.0
PreTest	33.37	117.9	88.4	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 ºC: **1.13E-07** cm/sec

(i_o)ave = 24.0

Tested By: DT Reviewed By: G. Thomas

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APPENDIX C.2

PREVIOUS INVESTIGATION BORING LOGS

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APPENDIX C.2.1

PARSONS ENGINEERING SCIENCE DYE-TRACING STUDY
MONITORING WELL LOGS

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RILL. CONTR.: EDI
DRILLER: T. Lynch
GEOLOGIST: J. Titus
G TYPE: Mobile B-80
ING METHOD: Air Hammer

WATER LEVEL MEASUREMENT
EASUREMENT POINT: TOC
DATE/TIME: 10-Jun-93; 0956
EPTH TO WATER: 79.83 ft.

ENGINEERING-SCIENCE, INC.
DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 19-May-93; 0745
DATE/TIME END: 20-May-93; 1505

BORING/WELL ID: 17MW2

TOTAL DEPTH (feet): 173
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1906.29 ft. msl
GS ELEV.: 1903.99 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
0			DRILLING WITH 10-INCH AIR ROTARY BIT SILT and CLAY; color: dark yellowish brown (10YR4/4)		10-inch borehole	0
			BEDROCK SWITCH TO 8-INCH AIR HAMMER			
5	1ft/4min	+pwd	interbedded DOLOTONE and argillaceous DOLOSTONE			5
10	1ft/4min		DOLOSTONE: massive, hard color: gray (10YR5/1 to 2.5YR6/0)			10
			argillaceous DOLOSTONE: weathered, soft weathered color: light, yellowish brown (2.5Y7/6) unweathered color: gray (2.5Y6/0)			15
20	1ft/5min				8-inch borehole grout	20
			VOID, filled with fine SAND and SILT color: reddish brown		4-inch ID PVC riser	
25	1ft/4.5min					25
30	1ft/7min					30
35						35
40						40

RILL. CONTR.: EDI
DRILLER: T. Lynch
GEOLOGIST: J. Titus
IG TYPE: Mobile B-80
NG METHOD: Air Hammer

WATER LEVEL MEASUREMENT
EASUREMENT POINT: TOC
DATE/TIME: 10-Jun-93; 0956
EPTH TO WATER: 79.83 ft.

ENGINEERING-SCIENCE, INC.
DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 19-May-93; 0745
DATE/TIME END: 20-May-93; 1505

BORING/WELL ID: 17MW2

TOTAL DEPTH (feet): 173
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1906.29 ft. msl
GS ELEV.: 1903.99 ft. msl

DEPTH (FEET)	DRILL RATE	HO TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
45						45
50						50
			interbedded DOLOSTONE and argillaceous DOLOSTONE			55
			DOLOSTONE massive, hard color: gray (10YR5/1 to 2.5YR6/0)		8-inch borehole	
60					grout	60
			argillaceous DOLOSTONE weathered, soft weathered color: light, yellowish brown (2.5Y7/6) unweathered color: gray (2.5Y6/0)		4-inch ID PVC riser	
65		+pwd				65
70						70
75						75
			VOID, some clayey SILT color: reddish brown (7.5YR6/8)		bentonite seal (78-80)	
80						80

DRILL CONTR.: EDI
DRILLER: T. Lynch
GEOLOGIST: J. Titus
RIG TYPE: Mobile B-80
DRILLING METHOD: Air Hammer

WATER LEVEL MEASUREMENT
MEASUREMENT POINT: TOC
DATE/TIME: 10-Jun-93; 0956
DEPTH TO WATER: 79.83 ft.

ENGINEERING-SCIENCE, INC.
DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 19-May-93; 0745
DATE/TIME END: 20-May-93; 1505

BORING/WELL ID: 17MW2

TOTAL DEPTH (feet): 173
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1906.29 ft. msl
GS ELEV.: 1903.88 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
85	1ft/6min	+pwd				85
90						90
95			interbedded DOLOSTONE and argillaceous DOLOSTONE			95
100			DOLOTONE massive, hard color: gray (10YR5/1 to 2.5YR6/0)		8-inch borehole no grout present (80-142) due to formation bridging	100
105	1ft/1min		argillaceous DOLOSTONE weathered, soft weathered color: light, yellowish brown (2.5Y7/6) unweathered color: gray (2.5Y6/0)		4-inch ID PVC riser	105
110						110
115						115
120						120

DRILL CONTR.: EDI
DRILLER: T. Lynch
GEOLOGIST: J. Titus
RIG TYPE: Mobile B-80
DRILLING METHOD: Air Hammer

WATER LEVEL MEASUREMENT
MEASUREMENT POINT: TOC
DATE/TIME: 10-Jun-93; 0956
DEPTH TO WATER: 79.83 ft.

ENGINEERING-SCIENCE, INC. DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 19-May-93; 0745
DATE/TIME END: 20-May-93; 1505

BORING/WELL ID: 17MW2

TOTAL DEPTH (feet): 173
BOREHOLE DIAM: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1906.29 ft. msl
GS ELEV.: 1903.99 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
125						125
130			VOID, some CLAY and v. fine SAND MAJOR WATER PRODUCING ZONE		8-inch borehole; no grout present (80-142) due to formation bridging	130
135	111/5.5min	+pwd	interbedded DOLOSTONE and argillaceous DOLOSTONE DOLOSTONE massive, hard color: gray (10YR5/1 to 2.5Y6/0) argillaceous DOLOSTONE weathered, soft weathered color: light, yellowish brown (2.5Y7/6) unweathered color: gray (2.5Y6/0)		4-inch ID PVC riser	135
140						140
145					sand; bentonite seal (144-147) Baroid, 3/8" pellets	145
150					sand filter pack Morie, #1	150
155	111/1.3min				screen (150-170) PVC, 0.010 inch slot	155
160						160

RILL CONTR.: EDI
DRILLER: T. Lynch
GEOLOGIST: J. Titus
G TYPE: Mobile B-80
G METHOD: Air Hammer

WATER LEVEL MEASUREMENT
EASUREMENT POINT: TOC
DATE/TIME: 10-Jun-93; 0956
PTH TO WATER: 79.83 ft.

ENGINEERING-SCIENCE, INC.
DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 19-May-93; 0745
DATE/TIME END: 20-May-93; 1505

BORING/WELL ID: 17MW2

TOTAL DEPTH (feet): 173
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1906.28 ft. msl
GS ELEV.: 1903.99 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
	1ft/4min		interbedded DOLOSTONE and argillaceous DOLOSTONE			
165			DOLOSTONE massive, hard color: gray (10YR5/1 to 2.5YR6/0)		screen (150-170) PVC, 0.010 inch slot	165
170		+pwd	argillaceous DOLOSTONE weathered, soft weathered color: light, yellowish brown (2.5Y7/6) unweathered color: gray (2.5Y6/0)		sand filter pack Morie, #1	170
175						175
180						180
185						185
190						190
195						195
200						200

RILL CONTR.: EDI
DRILLER: T. Lynch
EOLOGIST: J. Titus
IG TYPE: Mobile B-80
ING METHOD: Air Hammer

WATER LEVEL MEASUREMENT
EASUREMENT POINT: TOC
DATE/TIME: 10-Jun-93; 0956
EPTH TO WATER: 147.33 ft.

ENGINEERING-SCIENCE, INC.
DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 21-May-93; 1630
DATE/TIME END: 24-May-93; 0925

BORING/WELL ID: 17MW3

TOTAL DEPTH (feet): 190
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1906.78 ft. msl
GS ELEV.: 1904.27 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
0			DRILLING WITH 10-INCH AIR ROTARY BIT SILT and CLAY; color: dark yellowish brown (10YR4/4)			0
			BEDROCK SWITCH TO 8-INCH AIR HAMMER			
5		+pwd	interbedded DOLOSTONE and argillaceous DOLOSTONE			5
			DOLOSTONE: massive, hard color: gray (10YR5/1 to 2.5YR6/0)		10-inch borehole 8-inch ID PVC surface casing	
10						10
			argillaceous DOLOSTONE: weathered, soft weathered color: light, yellowish brown (2.5Y7/6) unweathered color: gray (2.5Y6/0)			
15			VOID, filled with silty CLAY			15
			VOID, filled with silty CLAY color: reddish brown (7.5YR6/8)			
20						20
	1ft/10min					
25	1ft/14min				8-inch borehole grout	25
	1ft/4min				4-inch ID PVC riser	
30	1ft/4.5min		calcite vein			30
		+pwd				
35						35
	1ft/3.8min					
	1ft/6min					
40						40

DRILL CONTR.: EGI
DRILLER: T. Lynch
GEOLOGIST: J. Titus
RIG TYPE: Mobile B-80
DRILLING METHOD: Air Hammer

WATER LEVEL MEASUREMENT
MEASUREMENT POINT: TOC
DATE/TIME: 10-Jun-93; 0956
DEPTH TO WATER: 147.33 ft.

ENGINEERING-SCIENCE, INC. DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 21-May-93; 1630
DATE/TIME END: 24-May-93; 0925

BORING/WELL ID: 17MW3

TOTAL DEPTH (feet): 180
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1906.78 ft. msl
GS ELEV.: 1904.27 ft. msl

DEPTH (FEET)	DRILL RATE	MOISTURE	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
45						45
50	1ft/4min					50
			VOID, filled with orange brown silty CLAY moist			
	1ft/6min	+pwd	interbedded DOLOSTONE and argillaceous DOLOSTONE DOLOSTONE massive, hard color: gray (10YR5/1 to 2.5YR6/0)			55
60			argillaceous DOLOSTONE weathered, soft weathered color: light, yellowish brown (2.5Y7/6) unweathered color: gray (2.5Y6/0)		8-inch borehole grout 4-inch ID PVC riser	60
65						65
70	1ft/5.8	+pwd				70
			VOID, filled with silty CLAY			
75	1ft/5min					75
80	1ft/3.5min					80

RILL. CONTR.: ECI
DRILLER: T. Lynch
GEOLOGIST: J. Titus
RIG TYPE: Mobile B-80
DRILLING METHOD: Air Hammer

WATER LEVEL MEASUREMENT
MEASUREMENT POINT: TOC
DATE/TIME: 10-Jun-93; 0956
DEPTH TO WATER: 147.33 ft.

ENGINEERING-SCIENCE, INC.
DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 21-May-93; 1630
DATE/TIME END: 24-May-93; 0925

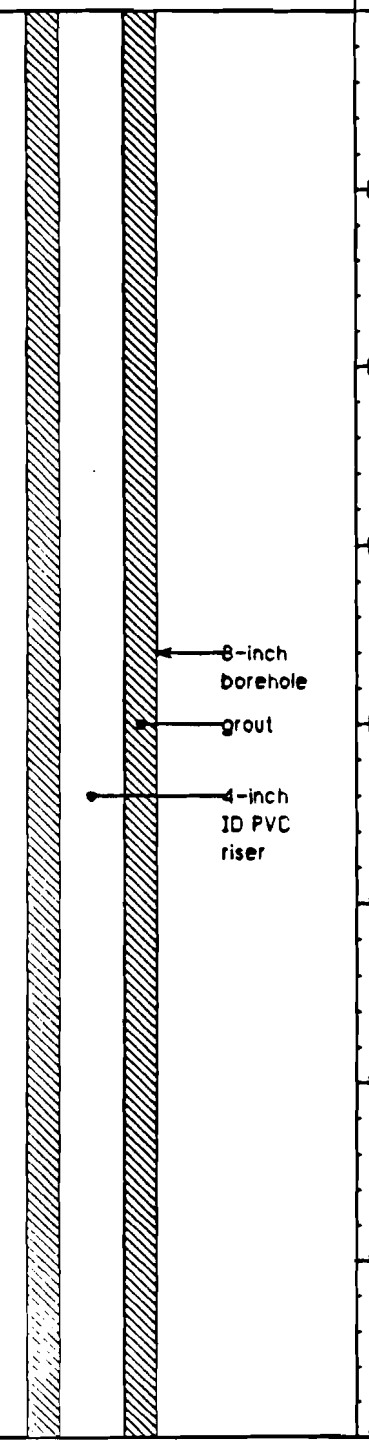
BORING/WELL ID: 17MW3

TOTAL DEPTH (feet): 190
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1906.78 ft. msl
GS ELEV.: 1904.27 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS
	1ft/4min		
	1ft/2min		
85	1ft/1min		
90			
	1ft/2.5min		
			interbedded DOLOSTONE and argillaceous DOLOSTONE
			DOLOSTONE massive, hard color: gray (10YR5/1 to 2.5YR6/0)
100			
			argillaceous DOLOSTONE weathered, soft weathered color: light, yellowish brown (2.5Y7/6) unweathered color: gray (2.5Y6/0)
	1ft/2min		
105	1ft/1min		
	1ft/1.8min		
			interbedded DOLOSTONE and argillaceous DOLOSTONE
			DOLOSTONE massive, hard color: gray (10YR5/1 to 2.5Y6/0)
110			
			argillaceous DOLOSTONE weathered, soft weathered color: light, yellowish brown (2.5Y7/6) unweathered color: gray (2.5Y6/0)
115			
120			

LITHOLOGIC COLUMN

WELL COMPLETION



DEPTH (FEET)

DRILL CONTR.: E.I
DRILLER: T. Lynch
GEOLOGIST: J. Titus
RIG TYPE: Mobile B-80
DRILLING METHOD: Air Hammer

WATER LEVEL MEASUREMENT
MEASUREMENT POINT: TOC
DATE/TIME: 10-Jun-93; 0956
DEPTH TO WATER: 147.33 ft.

ENGINEERING-SCIENCE, INC.
DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 21-May-93; 1630
DATE/TIME END: 24-May-93; 0925

BORING/WELL ID: 17MW3

TOTAL DEPTH (feet): 180
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1906.78 ft. msl
GS ELEV.: 1904.27 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
125						125
130						130
	1ft/5min.					135
140	1ft/6.5min.				8-inch borehole grout 4-inch ID PVC riser	140
145	1ft/5min.					145
150					bentonite seal (150-153) Baroid, 3/8" pellets	150
	1ft/3.2min.					
155					sand filter pack Morie, #1	155
160						160

RILL CONTR.: E T
DRILL: T. Lynch
GEOL IST: J. Tims
G T E: Mobile B-80
G METHOD: Air Hammer

WATER LEVEL MEASUREMENT
MEASUREMENT POINT: TOC
DATE/TIME: 10-Jun-93; 0956
DEPTH TO WATER: 147.33 ft.

ENGINEERING-SCIENCE, INC.
DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 21-May-93; 1630
DATE/TIME END: 24-May-93; 0925

BORING/WELL ID: 17MW3
TOTAL DEPTH (feet): 190
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1906.78 ft. msl
GS ELEV.: 1904.27 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
	1ft/1min		extremely soft-highly weathered argillaceous DOLOSTONE cuttings are moist, becoming more wet at 167 feet		screen (159-179) PVC, 0.010 inch slot	
165						165
					sand filter pack Morie, #1	
170	1ft/2.5min		rock becoming harder at 168 feet no return of cuttings, loss of circulation due to void (161.5-168 feet)			170
	1ft/1.3min					
			rock becoming harder			175
			VOID			
180			little return on cuttings some cuttings coming out of bore hole damp to wet			180
	1ft/2min					
185	1ft/40sec				collapsed debris in bottom of borehole	185
	1ft/1.5min					
			VOID			
190			END OF BORING AT 190 FEET			190
195						195
200						200

DRILL CONTR.: EDI
DRILLER: T. Lynch
GEOLOGIST: J. Titus
RIG TYPE: Mobile B-80
DRILLING METHOD: Air Hammer

WATER LEVEL MEASUREMENT
MEASUREMENT POINT: TOC
DATE/TIME: 06-Jun-93; 0930
DEPTH TO WATER: 81.95 ft.

ENGINEERING-SCIENCE, INC.
DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 21-May-93; 0900
DATE/TIME END: 25-May-93; 1317

BORING/WELL ID: 40MW3

TOTAL DEPTH (feet): 120
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1858.21 ft. msl
GS ELEV.: 1856.02 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
			DRILLING WITH 10-INCH AIR ROTARY BIT CLAYEY SILT; color: yellowish red (5YR5/8) dry to moist		10-inch borehole	
5						5
10						10
15			becoming more micaceous with depth			15
20			micaceous CLAYEY SILT; color: yellowish red (5YR5/8)		8-inch ID PVC surface casing grout 4-inch ID PVC riser	20
25						25
30						30
35			micaceous fine SAND; color: yellowish red (5YR5/8)			35
40			well to subrounded GRAVEL (0.5 to 1.5 in. diam.) and micaceous clayey fine SAND			40

RILL CONTR: EDI
DRILLER: T. Lynch
GEOLOGIST: J. Titus
IG TYPE: Mobile B-80
ING METHOD: Air Hammer

WATER LEVEL MEASUREMENT
EASUREMENT POINT: TOC
DATE/TIME: 06-Jun-93; 0930
EPTH TO WATER: 91.95 ft.

ENGINEERING-SCIENCE, INC. DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 21-May-93; 0900
DATE/TIME END: 25-May-93; 1317

BORING/WELL ID: 40MW3

TOTAL DEPTH (feet): 120
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1858.21 ft. msl
GS ELEV.: 1856.02 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
47			well to subrounded GRAVEL (0.5 to 1.5 in. diam.) and micaceous clayey fine SAND		10-inch borehole; 8-inch PVC surface casing; 4-inch ID PVC riser	47
52			weathered BEDROCK			52
			COMPETENT BEDROCK SWITCH TO 8-INCH AIR HAMMER argillaceous DOLOSTONE		8-inch borehole	
57	1ft/45sec	+pwd	color: light gray (2.5YR7/0) weathered color: reddish yellow (7.5YR6/6) color: gray (10YR5/1 to 2.5YR6/0)			57
62	1ft/4min		becoming more massive with depth argillaceous DOLOSTONE: color: gray			62
			void filled with silty CLAY, dry color: olive yellow (2.5Y6/6)			
67						67
72	1ft/3.8min				8-inch borehole	72
77						77
			VOID, filled with silty CLAY, moist			
82			highly weathered zone, argillaceous DOLOSTONE, moist clay surrounding cuttings			82

DRILL CONTR.: EDI
DRILLER: T. Lynch
GEOLOGIST: J. Titus
RIG TYPE: Mobile B-80
DRILLING METHOD: Air Hammer

WATER LEVEL MEASUREMENT
MEASUREMENT POINT: TOC
DATE/TIME: 06-Jun-93; 0930
DEPTH TO WATER: 91.95 ft.

ENGINEERING-SCIENCE, INC.
DRILLING RECORD

INSTALLATION: RAAP
SITE: SWMU 17
CLIENT: USAEC
PROJECT NO.: FB517
DATE/TIME START: 21-May-93; 0900
DATE/TIME END: 25-May-93; 1317

BORING/WELL ID: 40MW3

TOTAL DEPTH (feet): 120
BOREHOLE DIAM.: 8 in.
CASING DIAM.: 4 in.
TOC ELEV.: 1858.21 ft. msl
GS ELEV.: 1856.02 ft. msl

DEPTH (FEET)	DRILL RATE	HCl TEST	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FEET)
	1ft/2.5min		interbedded DOLOSTONE and argillaceous DOLOSTONE DOLOSTONE massive, hard color: gray (2.5Y7/0 to 2.5YR6/0)		4-inch ID PVC riser	
89					bentonite seal (90-95) Baroid, 3/8" pellets	89
94	1ft/3.5min		argillaceous DOLOSTONE weathered, soft weathered color: light, yellowish brown (2.5Y7/6) unweathered color: gray (2.5Y6/0) cuttings becoming wet			94
99	1ft/4min				sand filter pack Morie, #1	99
	1ft/4min				screen (97-117) PVC, 0.010 inch slot	
104			VOID, containg calcite			104
			VOID			
109	1ft/2.5min					109
114						114
	1ft/1min		weathered zone, argillaceous			
			weathered zone, argillaceous			
119	1ft/1.5min		weathered zone, argillaceous			119
			END OF BORING AT 120 FEET			
						124

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APPENDIX C.2.2

VERIFICATION INVESTIGATION MONITORING WELL LOGS

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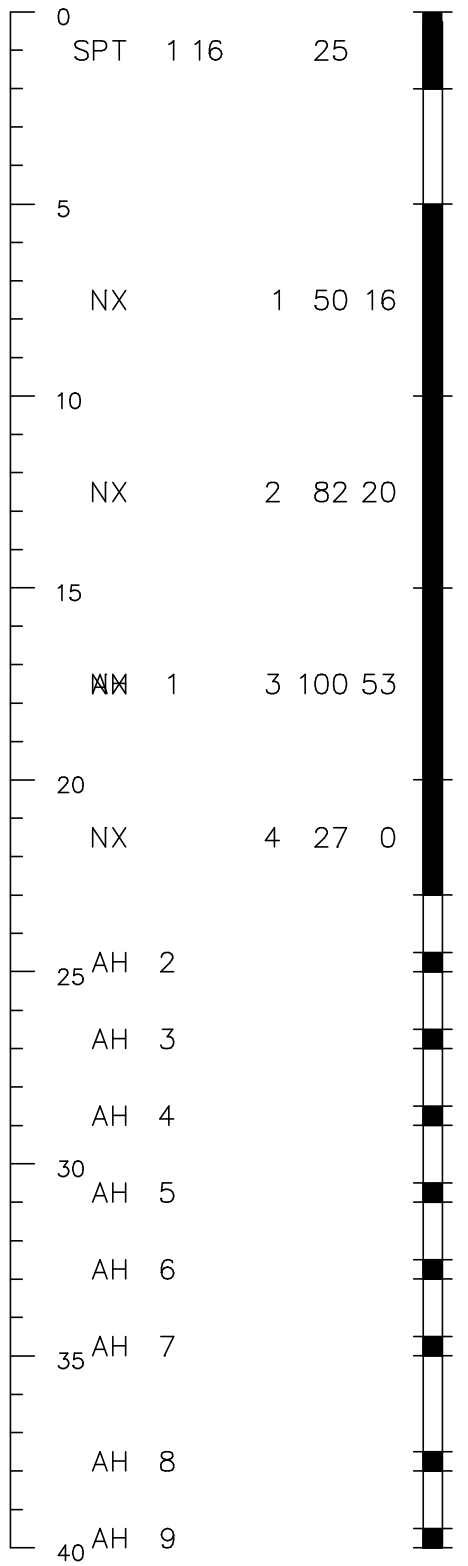
BORING 40MW1A

Surface Elevation: 0
Location: Radford AAP, Virginia
Start: 11:00 on 10-21-91
Finish: 10:53 on 10-22-91



Symbols	Description
CL	DARK YELLOWISH BROWN (10YR 4/6) SILTY CLAY, SLIGHT PLASTICITY, DRY
LS DS Shale	HIGHLY WEATHERED INTERBEDDED BLUISH GRAY AND BROWNISH GRAY DOLOSTONE AND RED SHALES, WITH FREQUENT ZONES OF CALCITE VEINS AND WEATHERED LIMESTONE SEAMS, MANY SEAMS WEATHERED TO CLAY
	DIPPING UP TO 20 DEGREES
	HIGHLY CLAYEY WITH BLACK MINERAL STAINING, SOFT
	GETTING HARDER CONTINUED HIGHLY FRACTURED DOLOSTONE, LIMESTONE AND SHALE, WITH MOST FRACTURES OCCURRING ALONG CLAY PARTINGS
	RED SHALE AND YELLOWISH BROWN LIMESTONE CONTENT INCREASING; BEDDING NEARLY HORIZONTAL
	CALCITE AND LIMESTONE SEAMS BECOMING PITTED
	VOID 21.5-23.0 FEET
	STOPPED CORING AT 23.0 FEET, DUE TO EXCESSIVE WATER LOSS AND POOR ROCK QUIALITY. SUBSEQUENT LOG OF BORING IS FROM ROCK CUTTINGS AND DRILLING CONDITIONS
	BROWNISH GRAY AND BLUISH GRAY LIMESTONE, INTERBEDDED WITH SILTY SHALES
	SAME, WITH SOME SOFT SILTSTONE SEAMS. SOME THIN CALCITE LAMINATIONS NOTED IN SOFT SILTSTONE CUTTINGS
	HIGHLY SILTY, CONTINUED INTERBEDDED DOLOSTONE LIMESTONE AND SHALE (SILTSTONE)
	GRADING HARDER

PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 40MW1A (Cont'd)

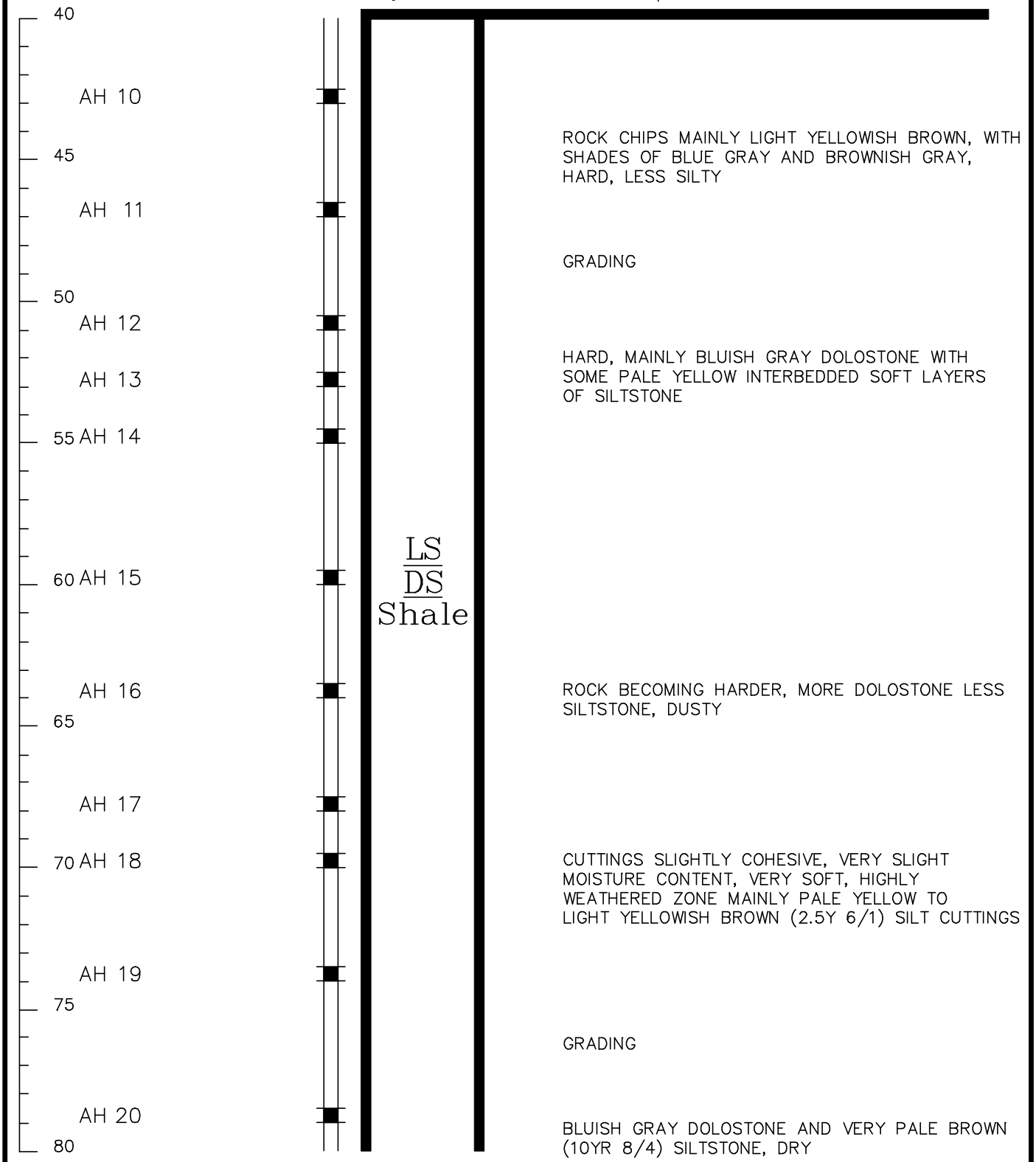


PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 40MW1A (Cont'd)

Depth (Feet)	Sampling Method	Sample No.	Blows/Foot	Core Run No.	% Recovery	RQD %	Sample Interval	Symbols	Description
80									ROCK IS DOLOMITE, SHALE, AND LIMESTONE. SOFT, DRY AND SILTY
85		AH 21							BLUISH GRAY AND LIGHT BROWNISH GRAY DOLOSTONE, MUCH HARDER, DRY, DUSTY
90		AH 22							WITH SOME VERY PALE BROWN SOFT INTERBEDDED SILTSTONE SEAMS
		AH 23							BECOMING LIGHT GRAY (10YR 7/1) LIMESTONE
95		AH 24							
100		AH 25						LS DS Shale	
		AH 26							
105									STOP DRILLING 6:16 PM 10-21-91
									RESUME DRILLING 7:40 AM 10-22-91 NO WATER INFLUX
		AH 27							WITH MORE BROWN (10YR 5/3) SILTSTONE, SOFTER
110									
		AH 28							BLUISH GRAY LIMESTONE AND DOLOSTONE
115									
		AH 29							
									GETTING HARDER, DARKER GRAY
120									

PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 40MW1A (Cont'd)

Depth (Feet)	Sampling Method	Sample No.	Blows/Foot	Core Run No.	% Recovery	RQD %	Sample Interval	Symbols	Description
120	AH	30							SAME, DRY, HARD
125	AH	31							BECOMING LESS DUSTY, SOFTER
130	AH	32							BLUISH GRAY WITH ABUNDANT CALCITE CRYSTALS AND PALE YELLOW (5Y 7/2) SILTSTONE LAYERS LINE 4
135	AH	33							SOFTER, SILTY, WITH TRACE FINE SAND, SLIGHTLY MOIST CUTTINGS ARE SMALL, ROUNDED
140	AH	34						LS/DS Shale	SAME
145	AH	35							SAME
150	AH	36							SAME
155	AH	37							SAME
160	AH	38							SAME BORING TERMINATED AT A DEPTH OF 162.0 FEET

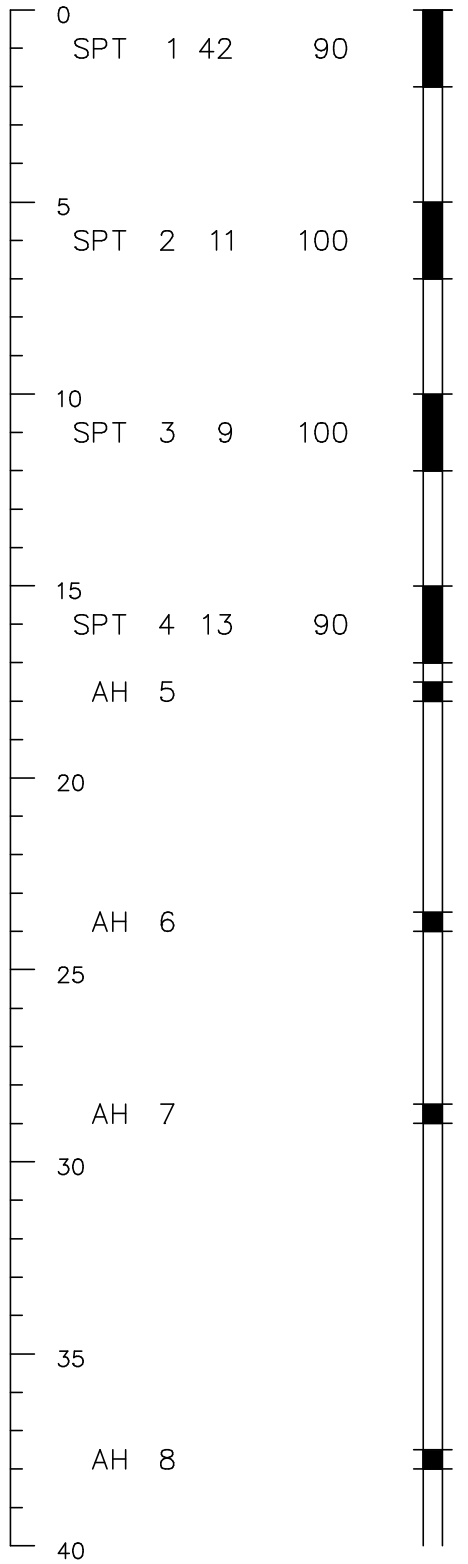
PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 40MW2

Surface Elevation: 1881.1 Feet
Location: Radford AAP, Virginia
Start: 13:42 on 10-29-91
Finish: 11:00 on 10-30-91



Symbols	Description
ML	REDDISH YELLOW (7.5YR 5/8) SILTY CLAY, TRACE SAND, STIFF, DRY
	GRADED CONTACT
	YELLOWISH RED (5YR 5/8) CLAYEY SILT SLIGHTLY PLASTIC, SLIGHTLY MOIST
	WITH OCCASIONAL VERY FINE SANDY LENSES
ML	VERY MOIST, BECOMING SANDY
	THIN SILT SEAM, LIGHT YELLOWISH BROWN (2.5Y 6/4), STIFF, DRY, BRITTLE, FROM 16.5-17.0 FEET, OVERLYING BEDROCK
LS/DS/Shale	LIGHT BROWNISH GRAY (10YR 6/2) HIGHLY WEATHERED DOLOSTONE (SILTSTONE) DID NOT ATTEMPT NX ROCK CORING AT THIS LOCATION DUE TO THE POOR ROCK QUALITY AND EXCESSIVE WATER LOSSES AT BORINGS 40MW1A, 40MW3A, AND 40MW4. THIS BORING WAS LOGGED BY VISUAL OBSERVATION OF CUTTINGS SAMPLES COLLECTED WITH THE AIR HAMMER
	SOFT, FAST DRILLING
	GRAY (10YR 6/1) DOLOSTONE, HIGHLY WEATHERED, SOFT, WITH INTERBEDDED SEAMS OF WEATHERED SILTSTONE (PALE BROWN) AND LIMESTONE
	WITH SEAMS DARKER GRAY AND BLUISH GRAY DOLOMITE SEAMS
	BECOMING HARDER DOLOSTONE, WITH MORE OF THE BLUISH GRAY DOLOSTONE, AND SOME SOFT LIMESTONE SEAMS

PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 40MW2 (Cont'd)

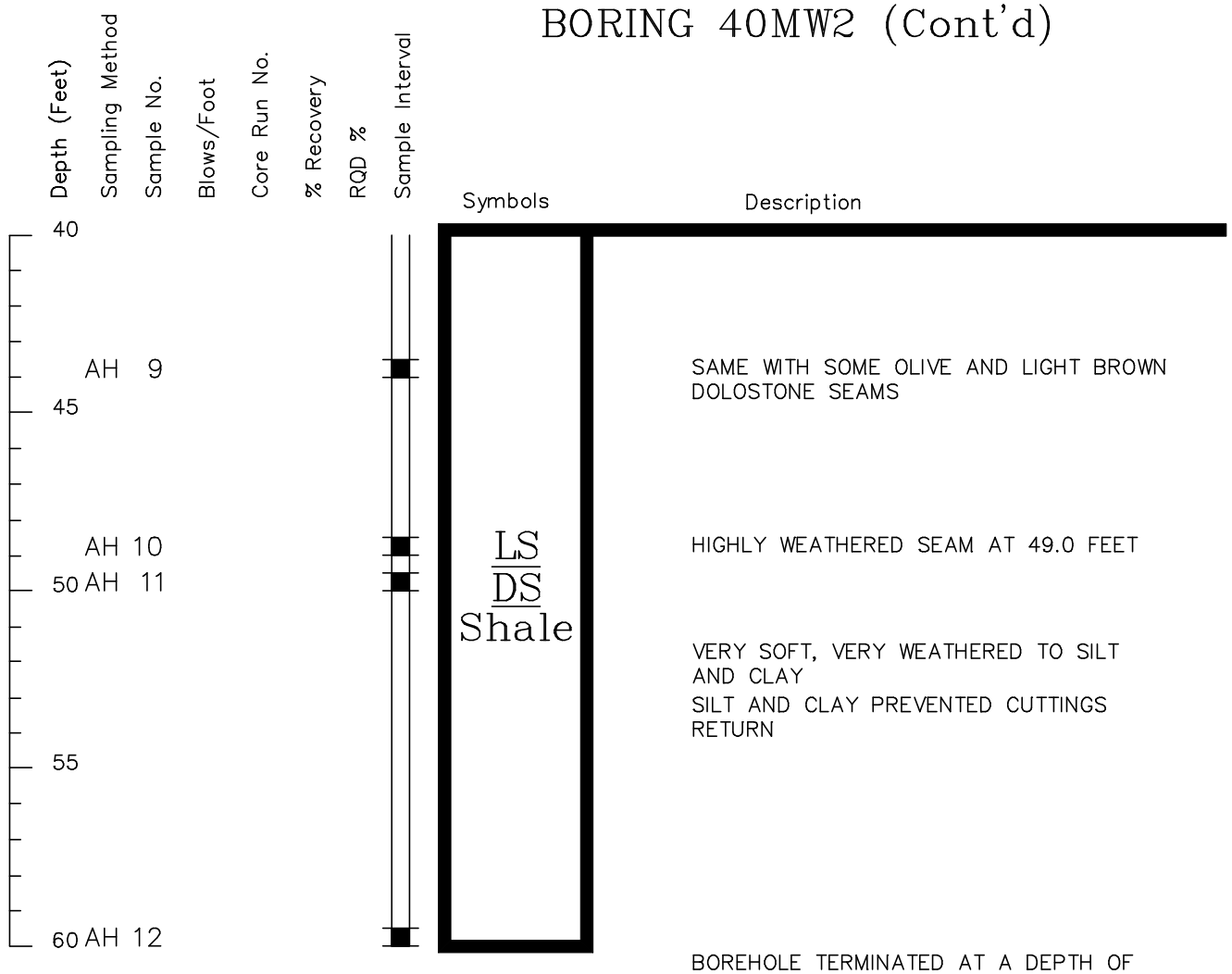


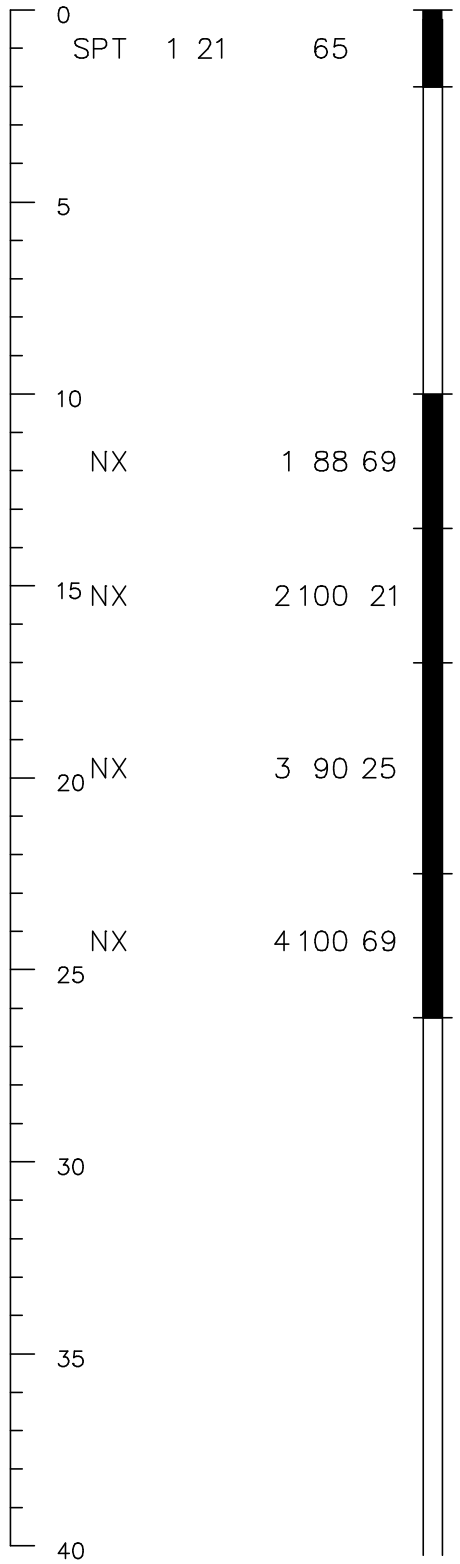
PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 40MW3A

Surface Elevation: 1905.0 Feet, MSL
Location: Radford AAP, Virginia
Start: 10:31 on 10-18-91
Finish: 10:15 on 10-21-91



Symbols	Description
CL	DARK YELLOWISH BROWN (10YR 5/4) CLAY, TRACE FINE SAND, WITH SOME BLACK STAINING AT 1.5 FEET, SOME CINDERS AND GRAVEL TO 1.5 FEET
DS LS Shale	LIGHT YELLOWISH BROWN (2.5Y 6/4) SILTSTONE WITH HIGHLY WEATHERED DOLOSTONE AND LIMESTONE SEAMS DUE TO POOR ROCK QUALITY DID NOT CORE UNTIL 10.0 FEET TO TRY TO AVOID EXCESSIVE WATER LOSS VERY PALE BROWN (10YR 7/3) DOLOSTONE WITH VERY THIN LIMESTONE SEAMS LIMESTONE SEAMS BECOMING THICKER, WITH SOME PITS, VUGS, AND CAVITIES WITH THIN LAYERS OF LIGHT GREENISH GRAY AND PALE BROWN DOLOSTONE, WITH MANY FRACTURES WHICH OCCUR ALONG BEDDING PLANES BECOMES THINLY BEDDED, MODERATELY WEATHERED, PALE BROWN DOLOSTONE HIGHLY FRACTURED FROM 20.0-21.0 FEET BECOMING BLUISH GRAY (N/4) DOLOSTONE AT 22.5 FEET, HARD, WITH SOME BROWNISH YELLOW STAINING AT FRACTURES STOP NX CORING AT 26.2 FEET DUE TO EXCESSIVE WATER LOSS VERY DUSTY, DRY BECOMES SOFTER AT 31.5-32.0 FEET SLIGHTLY MOIST AT 36.0 FEET
Void	ENCOUNTERED A VOID OR CAVITY AT 38.0 FEET

PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 40MW3A (Cont'd)

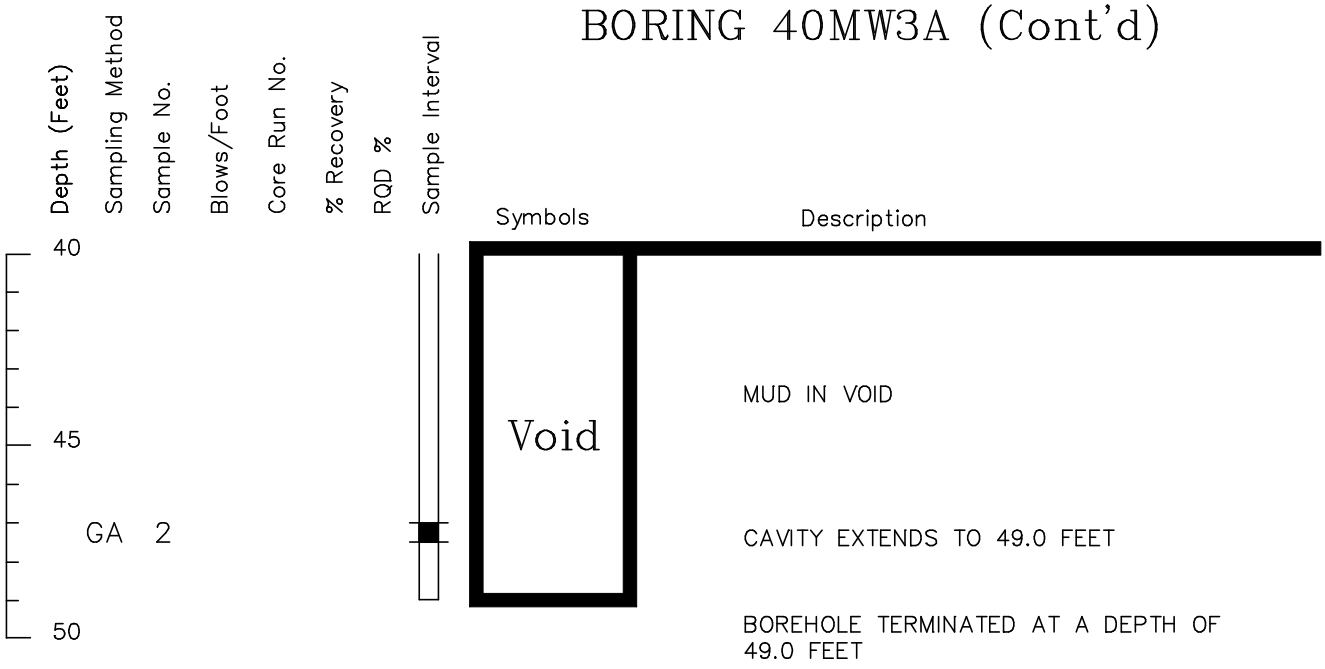


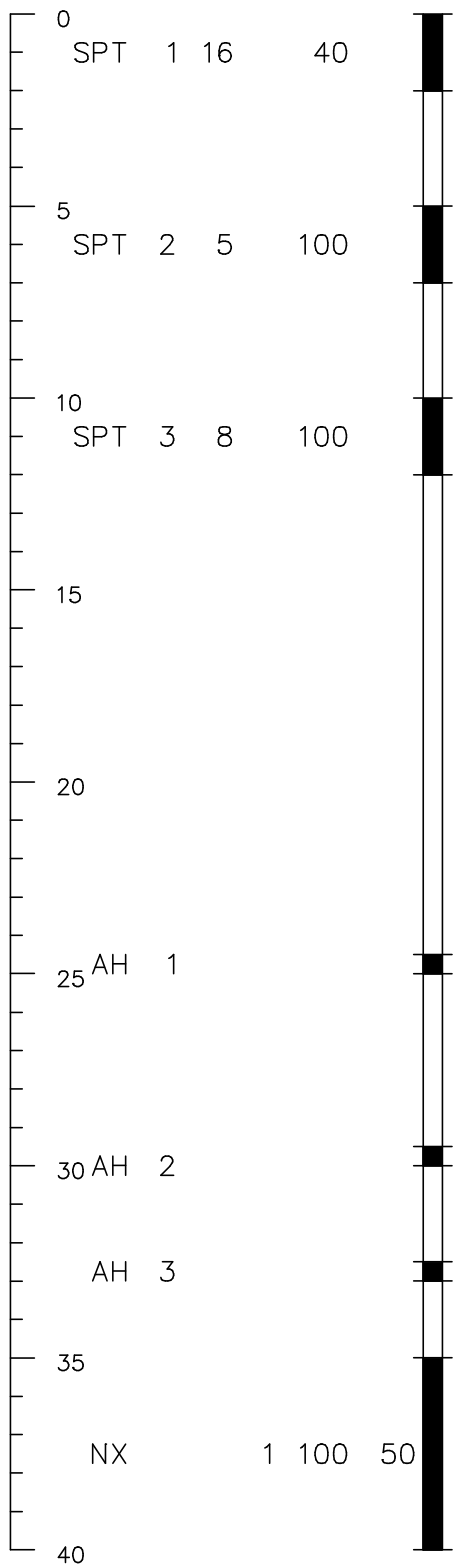
PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 40MW4

Surface Elevation: 1906.1 Feet, MSL
Location: Radford AAP, Virginia
Start: 08:45 on 10-28-91
Finish: 08:59 on 10-29-91



Symbols	Description
ML	YELLOWISH BROWN (10YR 5/4) FINE SANDY SILT, OVERLAIN BY YELLOWISH BROWN CLAY WITH GRAY MOTTLING
	SLIGHTLY MOIST, WITH SOME FINE TO MEDIUM SAND, COHESIVE, SOFT
	GRADING MORE MOIST
	STRONG BROWN (10YR 5/6)
	WHITE (10YR 8/1) CLAY SEAM, VERY MOIST, OVERLYING ROCK AT 14.0 FEET
	ROCK IS HIGHLY WEATHERED
	ATTEMPT AT NX CORING AT THIS DEPTH WOULD PROBABLY RESULT IN EXCESSIVE WATER LOSS. BOREHOLE WAS THEREFORE REAMED WITH AN 8-INCH AIR HAMMER TO A DEPTH OF 35.0 FEET WHERE ROCK CORING WAS ATTEMPTED
	INTERBEDDED GRAY DOLOSTONE AND LIGHT BROWN (7.5YR 6/3) SILTSTONE AND LIMESTONE SEAMS
LS/DS Shale	CUTTINGS REPRESENT HIGHLY WEATHERED INTERBEDDED DOLOSTONE AND SILTSTONE LAYERS, OBUNDANT SILT
	GRAY (N/6) DOLOSTONE, GETTING HARDER
	BEGIN CORING AT 35.0 FEET
LS/DS	DOLOSTONE, PALE OLIVE (5Y 6/3) WITH THIN LIMESTONE SEAMS, WHICH ARE SLIGHTLY PITTED. BEDDING DIPS SLIGHTLY. SOME BLACK MINERAL STAINING AT FRACTURES, BLUISH GRAY FROM 36.1-36.7 FEET
	37.5-39.0 FEET ARE LIGHT RED (10YR 6/6) SEAMS OF DOLOSTONE
	39.0 FEET GRAY N/6 DOLOSTONE

PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 40MW4 (Cont'd)

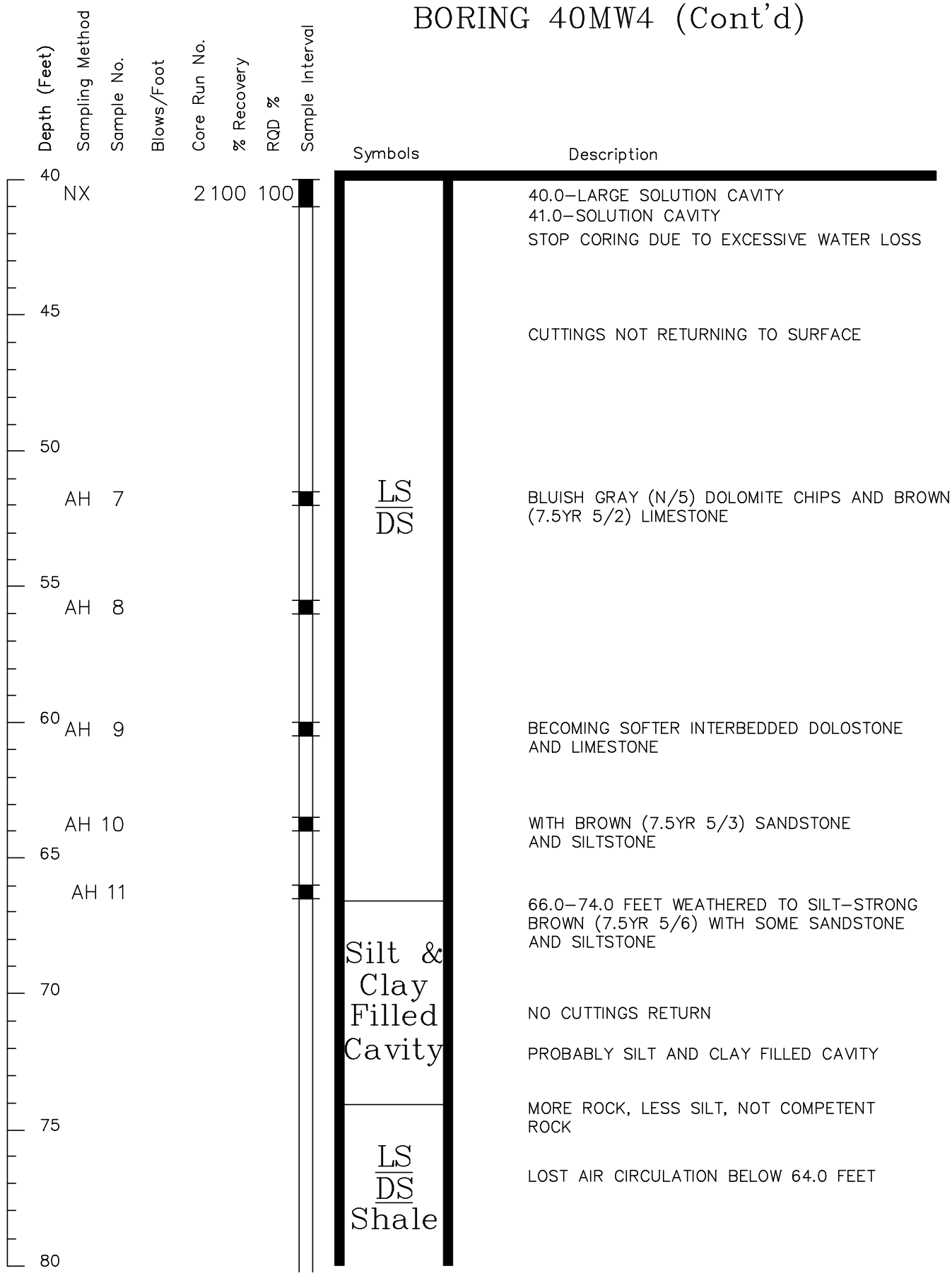


PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 40MW4 (Cont'd)

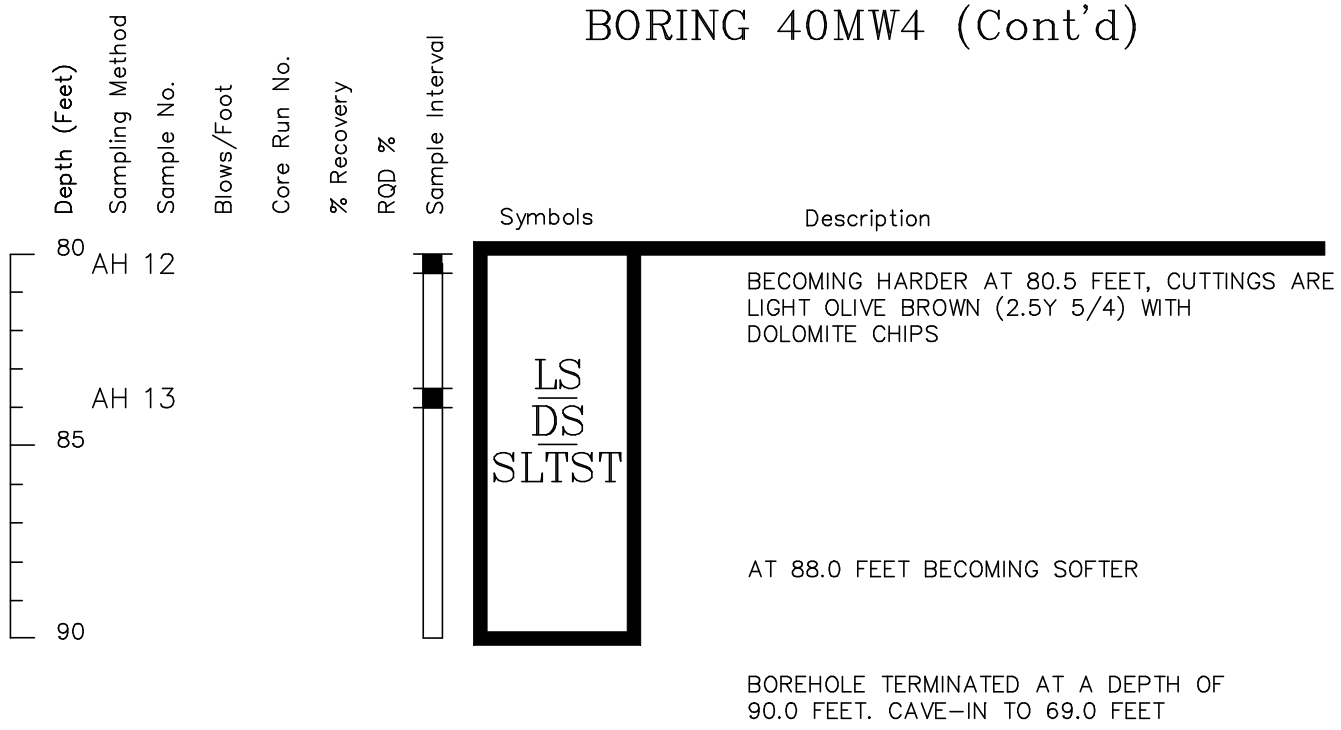


PLATE
LOG OF BORING

Dames & Moore

FILE

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APPENDIX C.3

RCRA FACILITY INVESTIGATION
BORING LOGS

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Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB1

Sheet 1 of 1

Date(s) Drilled	**11/15/2002 9:45 - 11:30**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**11.0 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1901.9**
Groundwater Level(s)	**NA**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES % Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 5/6, strong brown, CLAY, moist, plastic, stiff, occasional black cinders, trace gravel	Sample 40SB1A collected from 0-1 ft bgs.
	1				ND				
1900	2		1	63	ND		CH		
	3				2.0			7.5YR 2.5/1, black LANDFILL MATERIAL (glass, rope, plastic, cinders) in SILTY SAND matrix, moist, trace gravel	
	4				0.8				Samples 40SB1F and D-5 collected from 4-8 ft bgs.
	5				2.0				
	6		2	35	1.0		FILL		
1895	7				ND				Sample 40SB1B collected from 7-9 ft bgs.
	8				0.6				
	9				ND			2.5YR 4/2, dark grayish brown, fine SANDY CLAY, moist, stiff, medium plasticity	Sample 40SB1C collected from 9-10 ft bgs.
	10		3	75	ND		CL	7.5YR 5/8, strong brown, SILTY CLAY, moist, stiff, plastic	
	11							Refusal, borehole terminated at 11 feet bgs	
1890	12								
	13								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB1

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB2

Sheet 1 of 1

Date(s) Drilled	**11/15/2002 8:21-9:30**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**15.1 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1902.1**
Groundwater Level(s)	**NA**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	% Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						CH	7.5YR 5/6, strong brown, CLAY, stiff, medium plasticity, trace sand, moist	Sample 40SB2A collected from 0-1 ft bgs.
1900	2		1	75	ND		SP ML	7.5YR 3/3, dark brown to 2.5YR 3/1, dark gray, SAND, moist, with LANDFILL MATERIAL, tar paper, underlain by cinders, slight odor	
	4							7.5YR 5/6, strong brown, fine SANDY SILT, moist, medium stiff	
	6		2	50	ND		SM	2.5YR 4/2, dark grayish brown, SILTY fine SAND, very moist, medium dense	
1895	8							5Y 4/2, olive gray, fine to coarse SANDY SILT, wet, very soft, cinders	Sample 40SB2F collected from 8-12 ft bgs.
	10		3	100	ND		ML	Black stains with abundant cinders Increasing fine to coarse SAND Cinders	
1890	12							Black highly acrid odor with LANDFILL MATERIAL, plastic sheeting, fiberous material, plastic	Sample 40SB2B collected from 12-13 ft bgs.
	14		4		1.0		CL/ML	5Y5/3, olive, CLAY, fat, underlain by hard SILT	Sample 40SBC collected from 14-15.1 ft bgs.
	16							Refusal, borehole terminated at 15.1 feet bgs	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB2

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB3

Sheet 1 of 1

Date(s) Drilled	**11/14/2002 14:35-15:15**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**8.9 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1905.3**
Groundwater Level(s)	**NA**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES % Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1905	0							5YR 5/6, strong brown, fine to medium SANDY CLAY, moist, stiff, low plasticity, trace gravel chips	Sample 40SB3A collected from 0-1 ft bgs.
	1						CL		
	2		1	100	ND				
							CH	Mottled 10YR 5/4, yellow brown, 5YR 4/6, yellow red, very dark grayish brown, fine SAND CLAY, moist, high plasticity	
	3								
	4							10YR 6/8, brown yellow, CLAYEY SILT, moist, soft, with weathered mudstone	Samples 40SB3B, MS, and MSD collected from 4-8 ft bgs.
	5								
1900							CL/ML		
	6		2	100	ND				
	7								
	8		3	100	ND		ML	10YR 7/8, yellow CLAYEY SILT with mudstone inclusions, moist, hard, rock in spoon tip	Sample 40SB3C collected from 8-8.9 ft bgs.
							CL	10YR 7/8, yellow, CLAY, moist, stiff, rock in sampler tip	
	9							Rrefusal, borehole terminated at 8.9 ft bgs	
	10								

URS

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB3

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB4

Sheet 1 of 2

Date(s) Drilled	**11/14/2002 9:45-13:30**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**44.8 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1896.6**
Groundwater Level(s)	**8**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	% Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						GRAVEL	Grass and gravel	Sample 40SB4A collected from 0-1 ft bgs.
					0.1			7.5YR 5/8, strong brown, CLAY, moist, stiff	
1895			1	75	ND		CL		
							CL	2.5YR 4/3, olive brown, fine SANDY CLAY, moist, stiff, medium plasticity	
								Black, LANDFILL MATERIAL with plastic sheeting, paper, plastic wire casing, wet	Sample 40SB4F and D-3 collected from 4-12 ft bgs.
	5		2	43					
1890					0.8				
					ND			LANDFILL MATERIAL, paper, plastic, and cardboard	
					1.2				
	10		3	75	ND		FILL		
1885									
			4	75	8.0				
	15								
1880									
			5	100	ND		CL	7.5YR 5/8, strong brown, SILTY SANDY CLAY, moist, medium stiff, low plasticity	
	20							7.5YR 6/8, reddish yellow, SILTY CLAY, moist, stiff, low plasticity	Sample 40SB4B collected from 20-24 ft bgs.
1875			6	100	0.1		CL		

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB4

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB4

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	% Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
							CL		
	25		7	100	ND		ML	Mottled 10YR 6/6, brownish yellow, 5YR 5/8, yellowish red, CLAYEY SILT, with , CLAYEY SILT, moist, with claystone inclusions, friable, stiff, low plasticity, soft	
1870									
	30		8	75	ND		CH	7.5YR 5/8, strong brown, CLAY, moist, high plasticity, trace fine sand and gravel, soft	
1865									
			9	75	ND		ML	7.5YR 6/8, reddish yellow, CLAYEY SILT, moist, soft, non-plastic	
	35								
1860			10	88	ND				
	40								
1855			11	75	ND			Gravel, wet	Samples 40SB4C and D-4 collected from 42-44.75 ft bgs.
			12	36			ML	10YR 6/6, brownish yellow, fine SANDY SILT, moist, trace gravel, soft, stiff, low plasticity	
	45							Refusal, borehole terminated at 44.8-feet bgs	
1850									

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB4

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB5

Sheet 1 of 1

Date(s) Drilled	**11/14/2002 8:40-9:30**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**9.0 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1901.8**
Groundwater Level(s)	**8**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES % Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						CH	7.5YR 5/6, strong brown, CLAY, moist, trace sandy, stiff, plastic	Sample 40SB5A collected from 0-1 ft bgs.
1900	1								
	2		1	88	ND				
	3						FILL	10YR 2/1, black FILL, cinder type material, moist, loose	
	4						CH	5YR 5/6, yellowish red, GRAVELLY fine SANDY CLAY, slightly moist, fat, hard, low plasticity	
	5						FILL	Black FILL with plastic, paper, styrofoam, and cinders, moist, loose	Sample 40SB5F collected from 4-8 ft bgs.
	6		2	18	ND				
1895	7								
	8						CH	2.5Y 5/4, light olive brown, CLAY, plastic	Sample 40SB5C collected from 8-9 ft bgs.
			3	33	ND		ML	2.5Y 7/4, pale yellow, SILT, dry, hard, friable	
	9							Refusal, borehole terminated at 9 ft bgs	
	10								
	11								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB5

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB6

Sheet 1 of 1

Date(s) Drilled	**11/13/2002 14:00-14:45**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**16.9 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1897.9**
Groundwater Level(s)	**12**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	% Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 5/6, strong brown, CLAY, trace sand, moist, stiff, plastic	Sample 40SB6A collected from 0-1 ft bgs.
	2		1	75	ND		CL		
1895								5YR 5/8, yellowish red, fine SANDY SILT with clay, moist, soft	
	4						ML	Plastic in sample collected at 4 feet bgs Increasing softness, wet	
	6		2	75	ND			10YR 3/1, very dark gray, CLAYEY SILTY GRAVEL, wet	Sample 40SB6F collected from 6-8 ft bgs.
1890							ML		
	8							5YR 3/2, dark olive gray, SILTY fine SAND, moist, cinders	
	10		3	75	ND		SM		
	12							▽	
1885								No Recovery due to rock in spoon tip	Sample 40SB6C collected from 12-16 ft bgs.
	14	○	4	0			NR		
	16								
			5		ND		ML	5Y 3/2, dark olive gray, SANDY SILT, soft, small pieces of plastic sheeting	
								Refusal, borehole terminated at 16.9 feet bgs.	
1880	18								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB6

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB7

Sheet 1 of 1

Date(s) Drilled	**11/13/2002 11:00-11:45**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**21.0 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1898.4**
Groundwater Level(s)	**6.5**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	% Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0								
			1	100	ND		CL	7.5YR 4/6, strong brown, CLAY, trace gravel, stiff, medium plasticity	Sample 40SB7A collected from 0-1 ft bgs.
1895							FILL	Gravel layer, appears to be fill	
	5						MLC	7.5YR 4/6, strong brown, CLAYEY SILT, wet, slight plasticity	
			2	38	ND				
1890							FILL	Black LANDFILL MATERIAL, paper products, foil/metal, fine to coarse SANDY GRAVEL matrix, strong odor	
	10		3	25	ND				Samples 40SB7F and D-2 collected from 12-14 ft bgs.
1885			4		ND				
	15								
1880			5		ND		GP	10YR 5/4, yellowish brown, CLAYEY SANDY GRAVEL, intermittent layers of olive silt	Sample 40SB7B collected from 17-20 ft bgs.
	20		6		ND		ML	2.5YR 6/6, olive yellow, SILT, moist, soft	Sample 40SB7C collected from 20-20.7 ft bgs.
1875								Refusal, borehole terminated at 21 feet bgs	
	25								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB7

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB8

Sheet 1 of 1

Date(s) Drilled	**11/13/2002 10:00-10:45**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**25.1 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1896.2**
Groundwater Level(s)	**NA**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	% Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1895	0		1	95	ND		CL	5YR 5/8, yellowish red, fine SANDY CLAY, stiff, plastic	Sample 40SB8A collected from 0-1 ft bgs.
							GP	Gravel layer	
							ML	2.5Y 6/4, light yellowish brown, SILT, trace sand, soft	
1890	5		2	100	ND		CL	5YR 4/4, reddish brown, medium SANDY CLAY, moist	
							FILL	2.5Y 4/2, dark grayish brown, SANDY SILT with LANDIFLL MATERIAL, paper and plastic Grading to black, sample filled with water, strong odor	Sample 40SBF collected from 6.5-20 ft bgs.
1885	10		3	50	ND				
			4	25	ND				
1880	15		5	50	ND		ML	2.5Y 4/3, olive brown, SILT trace sand, no plasticity, moist	Less evidence of fill
1875	20		6	13	ND		ML	2.5Y 4/4, olive brown, GRAVELLY CLAYEY SILT,slight plasticity, moist, soft	Sample 40SB8C collected from 20-25 ft bgs.
			7		ND				Pepsi can blocking recovery
1870	25							Refusal, borehole terminated at 25.1 ft bgs	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB8

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB9

Sheet 1 of 1

Date(s) Drilled	**11/13/2002 8:45-9:45**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1897.0**
Groundwater Level(s)	**4.5**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	% Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						CL	5YR 4/6, yellowish red, SILTY CLAY with grass/ organics, soft	
							FILL	7.5YR 4/4, brown, SILTY CLAYEY GRAVEL, fill layer, moist	Sample 40SB9A collected from 1-3 ft bgs.
1895			1	88	ND			7.5YR 6/6 reddish yelllow, SILT, slightly moist, hard, occasional black cinders,	
							ML		
					1.0			▽	
	5							7.5YR 5/6, strong brown, fine to medium gravel FILL, odor, wet	
			2	50	ND				
1890								Black, LANDFILL MATERIAL, plastic, white fiberous material, adhesive tape, strong odor, wet	Sample 40SB9F collected from 8-10 ft bgs.
	10		3	50	ND		FILL		
1885									
			4	100	ND				
	15							10YR 6/8, brownish yellow, SILT, trace medium sand, soft, no plasticity, wet	
1880									Sample 40SB9C, 40SB9CMS, 40SB9CMSD, collected from 16-20 ft bgs.
			5	100	ND		ML		
	20							Refusal, borehole terminated at 20 ft bgs	
1875									

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB9

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB10

Sheet 1 of 1

Date(s) Drilled	**11/13/2002 7:40-8:30**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**14.9 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1892.7**
Groundwater Level(s)	**13.5**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES % Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 4/6, strong brown, CLAY with gravel (#57 stone), moist, stiff	Sample 40SB10A collected from 0-1 feet bgs.
	2		1	100	ND		CL		
1890									
	4						CL/ML	2.5Y 3/1, very dark gray, SILTY CLAY, slightly moist, soft, slight black staining	Sample 40SB10F collected from 3-6 ft bgs.
								7.5YR 5/6, strong brown, CLAY, moist, highly plastic	
	6		2		ND		CH		
1885									
	8							2.5YR 5/8, red, SILT, moist, soft	
	10		3		ND				Sample 40SB10B collected from 10-12 ft bgs.
							ML		
	12								Sample 40SB10C collected from 12-15 ft bgs.
1880									
	14		4		ND			▽	
								Refusal, borehole terminated at 14.9 feet bgs	
	16								

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB11

Sheet 1 of 1

Date(s) Drilled	**11/12/2002 9:45-12:30**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**25.8 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1895.9**
Groundwater Level(s)	**25.6**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	% Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1895	0						ASH	Black cinders	
			1	100	ND		CL	5YR 4/6, yellowish red, SANDY CLAY, slightly moist, hard, slight plasticity Grading to 2.5Y 3/5, light olive brown, with gravel, moist	Sample 40SB11F collected from 2-4 ft bgs.
	5		2	50	ND		FILL	LANDFILL MATERIAL, paper, cinders, glass, gravel, woodchips, cardboard, plastic, in 5YR 3/1, very dark gray, SANDY CLAY matrix, moist, slight odor	
1890					2				
					0.8			5YR 3/1, very dark gray, SANDY CLAY, moist, with LANDFILL MATERIAL, wood chips, gravel, cardboard, plastic, slight odor	
	10		3	75	0.6				
1885					0.4				
					0.2			10YR 5/3, brown, LANDFILL MATERIAL ,moist, high plasticity, stiff	
					0.2		CH	7.5YR 5/6, strong brown, CLAY, moist, high plasticity, stiff, slight odor	Sample 40SB11B collected from 13-16 ft bgs.
			4	73	ND				
	15				ND				
1880								Black streaks	
			5	100	ND				
	20								Sample 40SB11C collected from 20-25.8 ft bgs.
1875									
			6	100	ND		ML	7.5YR 5/6, strong brown, SILT, some medium to coarse SAND, moist, soft	
								7.5YR 7/8, reddish yellow, SANDY SILT, wet, soft	
	25		7	100	ND			▽	
1870								Refusal, borehole terminated at 25.8 feet bgs.	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB11

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB12

Sheet 1 of 1

Date(s) Drilled	**11/11/2002 14:10-15:25**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**27.0 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1897.2**
Groundwater Level(s)	**12**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	% Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						ML	10YR 4/3, brown, fine SANDY SILT, moist, with grass and organic debris, soft	Sample 40SB12A collected from 0-1 ft bgs.
							CH	7.5YR 5/6, strong brown, SILTY CLAY, moist, slight plasticity, stiff	
							SP	10YR 3/2, very dark grayish brown, medium to coarse SAND, moist	
1895			1	100	ND		SC	5YR 4/6, yellow red, CLAYEY medium SAND, moist	
								Mottled 7.5YR 5/4, brown and gray, CLAYEY SILT, moist, stiff	
	5							10YR 5/4, yellowish brown, CLAYEY SILT, moist, trace fine sand, soft	
			2	95	ND		ML	7.5YR 5/6, strong brown, CLAYEY SILT, moist, soft, with hard claystone inclusions	
1890									
								Mottled 7.5YR 5/6, strong brown and red, SILT, moist, trace sand, very soft	Sample 40SB12B collected from 8-11 ft bgs.
	10		3	90	ND		ML	Becoming hard	
1885								▽	
								7.5YR 6/8, reddish yellow, CLAYEY SILT, wet, very soft	
			4	90	ND				
	15						ML		
1880									
			5	75	ND			Becoming hard, friable, with occasional gravel	
	20								
1875			6		ND			Fine SANDY SILT, wet, very soft	
							SM		Sample 40SB12C collected from 23-27 ft bgs.
	25		7		ND				
1870								Refusal, borehole terminated at 27 feet bgs	
	30								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB12

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB13

Sheet 1 of 1

Date(s) Drilled	**11/19/2002 9:05-9:40**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**6.2 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1895.5**
Groundwater Level(s)	**NA**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES % Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1895	0						GRAVEL	Gravel	
	1						CL	7.5YR 4/6, strong brown, SANDY CLAY, moist, stiff, plastic, occasional gravel	Sample 40SB13A collected from 1-2 ft bgs.
	2		1	88	ND				
	3							10YR 4/4, dark yellowish brown, CLAY (FILL), moist, hard, plastic, with occasional gravel	
	4						CL	2.5YR 4/4, olive brown, CLAY (FILL), moist, stiff, plastic, with small twigs (Fil to 5.2 ft bgs)	Sample 40SB13B collected from 4-5 ft bgs.
	5		2	80	ND				Sample 40SB13C and D-6 collected from 5-6 ft bgs.
1890							SL	2.5Y 7/4, pale yellow, weathered rock SAPROLITE	
	6		3					Refusal, terminated at 6.2 feet bgs	
	7								
	8								
	9								
	10								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB13

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB14

Sheet 1 of 1

Date(s) Drilled	**11/18/2002 13:45-14:45**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**13.4 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1893.9**
Groundwater Level(s)	**12**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	% Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							5YR 5/8, yellowish red, CLAY, moist, with gravel (#57 stone), hard, stiff, high plasticity	
	1								
	2		1	100	ND		CH		
	3							Grading to 7.5YR 4/6, strong brown, CLAY, mosit, stiff	
1890	4								
	5							7.5YR 4/6, strong brown, fine to medium SANDY CLAY with decreasing gravel (#57 stone), moist, medium stiff, plastic	
	6		2	88	ND		SC		
	7								
	8							7.5YR 6/8, reddish yellow, SANDY SILTY CLAY,moist, stiff, medium plasticity	
1885	9								
	10		3	63	ND		CL		
	11							Grading to 7.5YR 4/6, strong brown	
	12						ML	7.5YR 4/6, strong brown, SILT, wet, trace fine to coarse sand, no plasticity	
	13		4	100	ND		CH	7.5YR 4/6, strong brown, CLAY, wet, trace sand, stiff, high plasticity	
1880	14							Refusal, borehole terminated at 13.4 ft bgs	
	15								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB14

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB15

Sheet 1 of 2

Date(s) Drilled	**11/18/2002 15:00-15:55**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**31.5 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1892.9**
Groundwater Level(s)	**20**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES % Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 5/8, strong brown, slightly SANDY CLAY, slightly moist, trace gravel, stiff, plastic	
	2		1	75	ND				
1890							CL	Decreasing plasticity, increasing silt	
	4								
	6		2	100	ND				
							SC	7.5YR 5/6, strong brown, fine to coarse SANDY CLAY, moist, medium stiff, medium plasticity	
1885	8							7.5YR 5/8, strong brown, SANDY GRAVELLY CLAY, moist, soft, low plasticity	
	10		3	88	ND		CL		
							CH	10YR 4/3, brown, fine SANDY CLAY, moist, hard, plastic	
	12							No Recovery due to sample jammed in rod	
1880									
	14						NR		
	16						CH	5YR 5/8, yellowish red, SILTY CLAY, wet, high plasticity	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB15

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 40SB15

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES % Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1875	18		4	100	ND		CH		
	20							5YR 6/8, reddish yellow, fine SANDY SILT, wet, occassional clayey silt lenses, soft	
	22		5	100	ND		ML		
1870	24							5YR 6/8, reddish yellow, SILT, wet, trace fine to coarse sand and gravel, occassional red laminations, very soft	
	26		6	100	ND				
1865	28						ML	7.5YR 7/8, reddish yellow, SILT, wet, occassional mudstone, very soft, slight plasticity	
			7		0.2				
	30				0.4				
					0.8				
	32							Refusal, borehole terminated at 31.5 feet bgs	
1860									
	34								
	36								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 40SB15

Project: SWMU 40/71 **Project Location: Radford, Virginia** **Project Number: 09604-258**	**Log of Test Pit 40TP-1**

Date(s) Excavated	**11/20/02 10:15-12:40**	Logged By	**T. Lamaskin**	Checked By	**J. Spencer**
Length of Excavation		Width of Excavation	**3 feet**	Depth of Excavation	**13.7 feet**
Excavation Equipment	**Backhoe, Rubber Tired**	Excavation Contractor	**Richard Simmons Drilling Co., Inc.**	Approximate Surface Elevation	**Center of Pit 1897.3**
Water Observations	**After 2 Hours, Open Pit Contained Approximately 2 feet of Standing Water**			Approximate Pit Trend	
Comments	**N 3594858 E 10887796**				

Elevation feet	Depth, feet	Sample Type	Sample Number	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Water Content	REMARKS AND OTHER TESTS
	0				SC	7.5YR 5/8, strong brown, medium CLAYEY SAND, moist		
1896	1				FILL	7.5YR 5/8, strong brown, medium CLAYEY SAND, with abundant LANDFILL MATERIAL, gravel, paper and plastic bags, moist		
	2					Grading to 10YR 2/1 black staining, sulfur odor Thin layer of plastic sheeting		
1894	3				CL	7.5YR 4/1, dark gray, CLAY, bentonite-like material, wet		Water seepage
	4				FILL	Thin layer of plastic sheeting at approx. 3.6 ft bgs 10YR 2/1, black, LANDFILL MATERIAL, consisting of paper, plastic, metal, rubber, glass, and bagged garbage-type material matrix of black CLAYEY SAND. Trace to abundant black gravel/slag, acrid odor, newpaper dated 1971, wet		
1892	5		TP1F1					Sample TestPit1F collected at 5 ft bgs.
	6							
	7				SC	5Y 5/2, olive-gray, CLAYEY SAND, with black gravel, wet		
1890	8				FILL	10YR 2/1, black, FILL with clay and sand, LANDFILL MATERIAL same as 3.5 to 6.5 bgs, wet		Water seepage
1888	9							
	10							
1886	11							From 11 feet to base of test pit, water seepage
	12							
1884	13		TP1F2					Sample TestPit1F2 collected at 13 ft bgs.
	14					Base of Test Pit Excavation		
	15							

Report: ENV_RIC_TEST_PIT; File: RFAAP40 &71.GPJ; 10/14/2003 40TP-1

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Test Pit 40TP-2

Date(s) Excavated	**11/20/02 13:45-15:00**	Logged By	**T. Lamaskin**	Checked By	**J. Spencer**
Length of Excavation		Width of Excavation	**3 feet**	Depth of Excavation	**13.0 feet**
Excavation Equipment	**Backhoe, Rubber Tired**	Excavation Contractor	**Richard Simmons Drilling Co., Inc.**	Approximate Surface Elevation	**Center of Pit 1903.5**
Water Observations	**Water Not Present in Excavation**			Approximate Pit Trend	
Comments	**N 3594739 E 10887841**				

Elevation feet	Depth, feet	Sample Type	Sample Number	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Water Content	REMARKS AND OTHER TESTS
	0							
					SW	7.5YR 5/6, strong brown, silty, medium SAND, moist		
	1							
1902								
	2				FILL	10YR 2/1, FILL, black SANDY GRAVEL, slag-type material abundant, moist to wet		
	3					Slag-type material		
1900								
	4				SC	10YR 5/4, yellowish brown, fine CLAYEY SAND, moist		
	5					10YR 2/1, black,LANDFILL MATERIAL, slightly decomposed, matrix of black CLAYEY SAND, consisting of paper, plastic, metal, rubber, glass, and bagged garbage, abundant black gravel/slag, acrid odor, moist		
1898								
	6		TP2F					Sample TestPit2F collected from 6 ft bgs.
	7							
1896								
	8				FILL			
	9							
1894								
	10							
	11		TP2B			10YR 4/2, dark grayish brown, fine CLAYEY to SILTY SAND, moist		Sample TestPit2BP collected from 11 ft bgs.
1892								
	12				SW-SC			
	13					Base of excavation 13 feet bgs.		
1890								
	14							
	15							

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 71SB11

Sheet 1 of 1

Date(s) Drilled	**11/18/2002 11:35-12:45**	Logged By	**J. Spangler**	Reviewed By	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**6.9 feet**
Drill Rig Type	**Tractor- mounted Geoprobe**	Drill Bit Size/Type	**2-inch Macrocore**	Ground Surface Elevation	**1906.8**
Groundwater Level(s)	**NA**	Sampling Method	**2-inch Macrocore**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES % Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0				ND		CL	10YR 3/2, very dark grayish brown, CLAY with crush & run, black cinders, moist	Sample 71SB11A collected from 0.2-0.95 ft bgs.
	1				ND		SM	2.5Y 3/1, very dark gray, fine SILTY SAND with gravel	
1905			1	100			FILL	Black cinders in SILTY SANDY GRAVEL matrix	Sample 71SB11F collected from 1.4-2 ft bgs.
	2				0.8		CL	10YR 5/6, yellowish brown, SILTY CLAY, hard, low plasticity	Sample 71SB11B collected from 2-4.5 ft bgs.
	3				0.2			Refusal at 3.3 feet bgs, offset 5 feet	
	4				ND		CL	10YR 5/6, strong brown, SILTY CLAY, stiff, medium plasticity, moist	
	5				ND				
	6				ND		ML	5Y 5/3, olive, fine SANDY SILT, hard, friable, moist	Sample 71SB11C collected from 6-6.9 ft bgs.
1900	7							Refusal, borehole terminated at 6.9 ft bgs	
	8								
	9								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 10/14/2003 71SB11

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Key to Borehole Log

Sheet 1

Elevation feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number			Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

1 **Elevation:** Elevation in feet referenced to mean sea level (MSL) or site datum.

2 **Downhole Depth:** Depth in feet below the ground surface.

3 **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.

4 **Sample Number:** Sample identification number.

5 **Recovery:** Length of sample in inches recovered in continuous sampling interval; "NA" indicates data not recorded.

6 **PID:** Each Macrocore sample screened with Photo Ionization Detector in parts per million

7 **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.

8 **USCS Code:** Unified Soil Classification System (USCS) group symbol code for associated soil strata.

9 **Material Description:** Description of material encountered; may include color, moisture, grain size, and density/consistency.

10 **Field Notes:** Observations regarding drilling or sampling made by driller or field personnel.

TYPICAL SOIL GRAPHIC SYMBOLS

CLAYEY SAND

Poorly graded GRAVEL

FILL

Low Plasticity CLAY

Well graded SAND

High Plasticity CLAY

SILT

SILTY SAND

TYPICAL SAMPLER GRAPHIC SYMBOLS

Macrocore Sample

OTHER GRAPHIC SYMBOLS

Water level observed during drilling

GENERAL NOTES

Report: ENV_12AS_CLEVELAND_W/USCS_KEY; File: RFAAP40 &71.GPJ; 10/14/2003 Borehole Key

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Key to Log of Test Pit

Elevation feet	Depth, feet	Sample Type	Sample Number	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Water Content	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9

COLUMN DESCRIPTIONS

1 **Elevation:** Elevation in feet referenced to mean sea level (MSL) or site datum.

2 **Depth:** Depth in feet below the ground surface.

3 **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.

4 **Sample Number:** Sample identification number.

5 **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.

6 **Lithologic Log:** USCS Code symbols for soils.

7 **Material Description:** Description of material encountered; may include color, moisture, grain size, and density/consistency.

8

9 **Remarks and Other Tests:** Comments and observations regarding excavation or sampling made by driller or field personnel. Field and laboratory test results (other than water content), using abbreviations explained below.

TYPICAL MATERIAL GRAPHIC SYMBOLS

CLAYEY SAND

Poorly graded GRAVEL

FILL

Low Plasticity CLAY

Well graded SAND

Well graded SAND with CLAY

TYPICAL SAMPLER GRAPHIC SYMBOLS

Grab Sample

OTHER GRAPHIC SYMBOLS

TYPICAL LABORATORY TEST ABBREVIATIONS

Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; field descriptions may have been modified to reflect lab test results. Descriptions on these logs apply only at the specific test pit locations and at the time the test pits were excavated; they are not warranted to be representative of subsurface conditions at other locations or times.

URS

Project: SWMU 40/71	Log of Borehole 71SB12
Project Location: Radford, Virginia	
Project Number: 09604-258	Sheet 1 of 1

Date(s) Drilled and Installed	**4/20/06**	Geologist	**J. Spangler**	Reviewer	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**6.0 feet**
Sampling Method	**2-inch Macrocore**	Drill Bit Size/Type	**2-inch Macrocore**	Top of Casing Elevation	
Size and Type of Well Casing		Groundwater Level(s)	**NA**	Approximate Surface Elevation	
Seal or Backfill		Groundwater Level(s)	**NA**		

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES: Samples	SAMPLES: % Recovery	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
0							7.5YR 5/8 strong brown CLAY, slightly moist, plastic, slightly sticky, homogeneous	
								Sample 71SB12A taken
1								
2	1		0					
3						CL	Slight saprolite texture	
								Sample 71SB12B taken
4								
5	2		0				Moisture increasing at 5.2 to 6.0	
								Sample 71SB12C taken
6							Refusal at 6.0 ft bgs	
7								
8								

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 1/3/2008 71SB12

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 71SB13

Sheet 1 of 1

Date(s) Drilled and Installed	**4/20/06**	Geologist	**J. Spangler**	Reviewer	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**9.0 feet**
Sampling Method	**2-inch Macrocore**	Drill Bit Size/Type	**2-inch Macrocore**	Top of Casing Elevation	
Size and Type of Well Casing		Groundwater Level(s)	**NA**	Approximate Surface Elevation	
Seal or Backfill		Groundwater Level(s)	**NA**		

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES: Samples	SAMPLES: % Recovery	SAMPLES: PID (ppm)	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
0						Block cinders and gravel mixture to 2.0	Sample 71SB13A taken
1							
2	1		0			5Y 54 olive CLAY, medium soprolite, horizontal bedding and 5Y 5/6 olive clay SAPROLITE, slightly moist, friable, some clay stone	
3							
4							
5							
6	2		5				Sample 71SB13B taken
7							
8						7.5YR 5/6 strong brown, stiff CLAY, slightly moist	
8	3		9				Sample 71SB13C taken
9						Refusal at 9.0 ft bgs.	
10							
11							

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 1/3/2008 71SB13

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 71SB14

Sheet 1 of 1

Date(s) Drilled and Installed	**4/20/06**	Geologist	**J. Spangler**	Reviewer	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**7.0 feet**
Sampling Method	**2-inch Macrocore**	Drill Bit Size/Type	**2-inch Macrocore**	Top of Casing Elevation	
Size and Type of Well Casing		Groundwater Level(s)	**NA**	Approximate Surface Elevation	
Seal or Backfill		Groundwater Level(s)	**NA**		

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES: Samples	SAMPLES: % Recovery	SAMPLES: PID (ppm)	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
0						7.5YR 3/3 dark brown CLAY, with grass and roots, slightly moist	Sample 71SB14A taken
1						Black cinders and GRAVEL, sand and silty, slightly moist	
2	1		2				
3							Sample 71SB14B taken
4						Landfill liner at beginning of 2nd sample	
5							
6	2		0.5				
7						Refusal at 7.0 ft bgs. No recovery in 2nd liner for sample.	Sample 71SB14C taken
8							
9							

URS

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 1/3/2008 71SB14

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 71SB15

Sheet 1 of 1

Date(s) Drilled and Installed	**4/20/06**	Geologist	**J. Spangler**	Reviewer	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**8.0 feet**
Sampling Method	**2-inch Macrocore**	Drill Bit Size/Type	**2-inch Macrocore**	Top of Casing Elevation	
Size and Type of Well Casing		Groundwater Level(s)	**NA**	Approximate Surface Elevation	
Seal or Backfill		Groundwater Level(s)	**NA**		

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES: Samples	SAMPLES: % Recovery	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
0							Black cinder and GRAVEL.	Sample 71SB15A taken
1							2.5Y 4/3 olive brown SAND, clayey sand, beginning of very fine material prevented good recovery	
2	1		2					
3								
4						SM		
5								Sample 71SB15B taken
6	2		2				Very fine material, wire, paper, unidentifiable material, plastic liner	
7								
8								Sample 71SB15C taken
9							Refusal at 8.0 ft bgs.	
10								

URS

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 1/3/2008 71SB15

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 71SB16

Sheet 1 of 1

Date(s) Drilled and Installed	**4/20/06**	Geologist	**J. Spangler**	Reviewer	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**5.0 feet**
Sampling Method	**2-inch Macrocore**	Drill Bit Size/Type	**2-inch Macrocore**	Top of Casing Elevation	
Size and Type of Well Casing		Groundwater Level(s)	**NA**	Approximate Surface Elevation	
Seal or Backfill		Groundwater Level(s)	**NA**		

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES: Samples	SAMPLES: % Recovery	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
0							7.5YR 3/3 dark brown SAND, slightly gravely, silty, slighlty moist, loose	
								Sample 71SB16A taken
1							7.5YR 4/4 brown, hard CLAY, black white mottled to 3.0	
2	1		4			CL		
3							7.5YR 5/8 strong brown, silty CLAY, moist, sticky	Sample 71SB16B taken
4								
							2.5Y 6/6 light yellow brown, very moist, sticky SILT, with gravel	
	2		1			ML		Sample 71SB16C taken
5							Refusal at 5.0 ft bgs.	
6								
7								

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 1/3/2008 71SB16

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 71SS11B

Sheet 1 of 1

Date(s) Drilled and Installed	**4/20/06**	Geologist	**J. Spangler**	Reviewer	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**7.0 feet**
Sampling Method	**2-inch Macrocore**	Drill Bit Size/Type	**2-inch Macrocore**	Top of Casing Elevation	
Size and Type of Well Casing		Groundwater Level(s)	**NA**	Approximate Surface Elevation	
Seal or Backfill		Groundwater Level(s)	**NA**		

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES: Samples	SAMPLES: % Recovery	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
0							Block cinders / gravel	
1								
2	1		0			ML	2.5Y 5/2 grayish brown, very fine sandy friable SILT, slightly moist to dry	Sample 71SS11B taken, plus Dup 2
3							7.5YR 5/8 strong brown, CLAY, stiff plastic, slightly moist, trace, very fine sand	
4								
5						CL		
6	2		4					
7							Refusal at 7.0 ft bgs.	
8								
9								

URS

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 1/3/2008 71SS11B

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 71SS12B

Sheet 1 of 1

Date(s) Drilled and Installed	**4/20/06**	Geologist	**J. Spangler**	Reviewer	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**11.2 feet**
Sampling Method	**2-inch Macrocore**	Drill Bit Size/Type	**2-inch Macrocore**	Top of Casing Elevation	
Size and Type of Well Casing		Groundwater Level(s)	**NA**	Approximate Surface Elevation	
Seal or Backfill		Groundwater Level(s)	**NA**		

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES: Samples	SAMPLES: % Recovery	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
0							Block cinders and gravel	
1							10YR 5/3 brown hard friable clay and SILT, mottled with 10YR 8/1 white, white grader out at 2.5'	
2	1		0			CL		
3							10YR 4/2 dark greyish brown clayey SILT, with very fine sand, slightly moist	
4							10YR 5/8 yellow brown, very fine sandy SILT	
5							10YR 6/8 brown yellow soft, clayey SILT, moist, with hard silts	
6	2		0					
7						ML		
8							2.5Y 5/4 light olive brown, very fine sandy SILT and 10YR 5/8 yellow brown, very fine sand and SILT	
9								
10	3		3					Sample 711SS12B taken.
11							Refusal at 11.2 ft bgs.	
12								
13								
14								

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 1/3/2008 71SS12B

URS

Project: SWMU 40/71
Project Location: Radford, Virginia
Project Number: 09604-258

Log of Borehole 71SS13B

Sheet 1 of 1

Date(s) Drilled and Installed	**4/20/06**	Geologist	**J. Spangler**	Reviewer	**J. Spencer**
Drilling Method	**Geoprobe - Hydraulic Push/ 2-inch diameter Macrocore**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**7.0 feet**
Sampling Method	**2-inch Macrocore**	Drill Bit Size/Type	**2-inch Macrocore**	Top of Casing Elevation	
Size and Type of Well Casing		Groundwater Level(s)	**NA**	Approximate Surface Elevation	
Seal or Backfill		Groundwater Level(s)	**NA**		

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES: Samples	SAMPLES: % Recovery	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
0							Block cinders and gravel	
1							Brown SILT, with white mottling, dry to slightly moist, friable	
2	1		0			ML		
3							Olive, SILT, very fine sandy, slightly moist	
4								
5							10YR 6/8 brown yellow silt CLAY, grades to olive at refusal	
6	2		0			CL		Sample 71SS13B taken
7							Refusal at 7.0 ft bgs.	
8								
9								

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP40 &71.GPJ; 1/3/2008 71SS13B

URS

Project: SWMU 40 Groundwater Investigation - 2007	Log of Borehole MW-5
Project Location: Radford Army Ammunition Plant	
Project Number: 21354880.10001	Sheet 1 of 5

Date(s) Drilled and Installed	**7-17-2007**	Geologist	**Jim Carter**	Reviewer	
Drilling Method	**Air Rotary**	Drilling Contractor	**Richard Simmons Drilling Company, Inc.**	Total Depth of Borehole	**157.0 feet**
Sampling Method		Hammer Data		Top of Casing Elevation	
Size and Type of Well Casing	**2-inch I.D. Schedule 40 PVC**	Screen Perforation	**0.010-inch**	Approximate Surface Elevation	
Seal or Backfill	**Bentonite pellets/Bentonite-cement grout**	Comments			

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Diagram	FIELD NOTES AND WELL DETAILS
	0					CLFG	7.5YR 4/3 brown sandy, gravelly CLAY, dry, stiff, no apparent odor.		
				0.4					
	5			0.5					
				0.5					
	10								
	15								
	20					CL	CLAY, some sand and gravel, moist to wet (wet at 13 feet), no odor.		
	25								
	30								

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP SWMU 40 MW5MW6.GPJ; 1/2/2008 MW-5

URS

Project: SWMU 40 Groundwater Investigation - 2007
Project Location: Radford Army Ammunition Plant
Project Number: 21354880.10001

Log of Borehole MW-5

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Diagram	FIELD NOTES AND WELL DETAILS
	30			0.6					PID stopped functioning, no readings taken after this depth.
	35					SHALE	SHALE, moderately dry, no apparent odor.		
	40					CLG	7.5YR 4/3 gravelly CLAY (interbedded rock and clay).		
	45					SHALE	SHALE.		
	50						LIMESTONE, moderately dry, no apparent odor.		
	55								
	60					SHALE	SHALE, moderately dry, no apparent odor.		Set 6" outer casing to a depth of 61 feet bgs.
	65								

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP SWMU 40 MW5MW6.GPJ; 1/2/2008 MW-5

URS

Project: SWMU 40 Groundwater Investigation - 2007
Project Location: Radford Army Ammunition Plant
Project Number: 21354880.10001

Log of Borehole MW-5

Elevation feet	Depth, feet	SAMPLES: Type Number	SAMPLES	SAMPLES	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Diagram	FIELD NOTES AND WELL DETAILS
	65									Grout: 10% Bentonite/Cement Slurry
	70							10YR 7/2 light gray LIMESTONE, moderately dry, no apparent odor.		
							SHALE	SHALE, moderately moist, no apparent odor.		
	75									
	80						GW-GC	Clayey GRAVEL (rock fragments), (shale/clay layer at 83 - 85 feet) very moist, no odor. This was the targeted depth of anomaly as indicated in resistivity survey.		
	85									
	90							LIMESTONE		
	95						SHALE	10YR 5/6 yellowish brown SHALE, moderately dry, may have slight odor.		
	100									

URS

Project: SWMU 40 Groundwater Investigation - 2007
Project Location: Radford Army Ammunition Plant
Project Number: 21354880.10001

Log of Borehole MW-5

Elevation feet	Depth, feet	SAMPLES: Type Number	SAMPLES:	SAMPLES:	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Diagram	FIELD NOTES AND WELL DETAILS
	105							7.5YR 5/3 gray brown LIMESTONE.		
	110						SHALE	SHALE, moderately dry, no apparent odor.		
								7.5YR 5/3 gray brown LIMESTONE, no apparent odor.		
	115						SHALE	SHALE, no apparent odor.		
	120							LIMESTONE, moderately dry , fractured rock at 123 to 123.5 feet, no apparent odor.		
	125						SHALE	SHALE, no apparent odor.		3/8-inch Hydrated Bentonite Pellets
								LIMESTONE, no apparent odor.		
	130						SHALE	SHALE, moderately dry, no apparent odor.		No. 2 Silica Quartz Sandpack
	135									

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP SWMU 40 MW5MW6.GPJ; 1/2/2008 MW-5

URS

Project: SWMU 40 Groundwater Investigation - 2007
Project Location: Radford Army Ammunition Plant
Project Number: 21354880.10001

Log of Borehole MW-5

Elevation feet	Depth, feet	SAMPLES Type Number	SAMPLES	SAMPLES	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Diagram	FIELD NOTES AND WELL DETAILS
	140							LIMESTONE, no apparent odor.		
	145						SHALE	SHALE, soft, wet, water at 143 feet.		Screen: 0.01-inch Factory Slotted, Sch 40, 2-inch PVC
	150							LIMESTONE, moist, no apparent odor.		
							SHALE	SHALE, no apparent odor.		
	155							LIMESTONE, moist, no apparent odor.		
								Boring was terminated at 157 feet below ground surface.		
	160									
	165									
	170									

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP SWMU 40 MW5MW6.GPJ; 1/2/2008 MW-5

URS

Project: SWMU 40 Groundwater Investigation - 2007	Log of Borehole MW-6
Project Location: Radford Army Ammunition Plant	
Project Number: 21354880.10001	Sheet 1 of 5

Date(s) Drilled and Installed	**7-16-2007**	Geologist	**Jim Carter**	Reviewer	
Drilling Method	**Air Rotary**	Drilling Contractor	**Richard Simmons Drilling Company, Inc.**	Total Depth of Borehole	**135.0 feet**
Sampling Method		Hammer Data		Top of Casing Elevation	
Size and Type of Well Casing	**2-inch I.D. Schedule 40 PVC**	Screen Perforation	**0.010-inch**	Approximate Surface Elevation	
Seal or Backfill	**Bentonite pellets/Bentonite-cement grout**	Comments			

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Diagram	FIELD NOTES AND WELL DETAILS
	0			12.7		CL	5YR 4/6 yellowish red sandy gravelly CLAY (almost equal amounts of clay and sand), loose, dry, no apparent odor.		
	5						Sandy silty CLAY, wet at 7 feet.		
				27.3					
	10								
	15								
	20			94.8		SHALE	7.5YR 5/4 brown SHALE, dry.		
	25								
	30								

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP SWMU 40 MW5MW6.GPJ; 1/2/2008 MW-6

URS

Project: SWMU 40 Groundwater Investigation - 2007
Project Location: Radford Army Ammunition Plant
Project Number: 21354880.10001

Log of Borehole MW-6

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Diagram	FIELD NOTES AND WELL DETAILS
	30			80.9			10YR 7/3 pink LIMESTONE, dry.		
							VOID FROM 31 - 34 FEET.		
	35						LIMESTONE, dry.		
	40						10YR 7/3 pink SHALE, clay layer at 42 - 44 feet.		
				0.4					
	45								
	50								Grout: 10% Bentonite/Cement Slurry
	55					SHALE	10YR 6/4 light yellowish brown SHALE, slightly moist.		
				1.1					
	60								
				1.4					
	65								

URS

Project: SWMU 40 Groundwater Investigation - 2007
Project Location: Radford Army Ammunition Plant
Project Number: 21354880.10001

Log of Borehole MW-6

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Diagram	FIELD NOTES AND WELL DETAILS
65							
70		1.1		SHALE	10YR 6/1 gray SHALE, moderately moist, no apparent odor.		PID stopped functioning, no readings taken after this depth.
75							
80					10YR 8/2 very pale brown shaley LIMESTONE, dry, no apparent odor.		Set 6" outer casing to a depth of 79 feet bgs.
85							
90					10YR 7/1 light gray shaley LIMESTONE, dry.		
95							
100							

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP SWMU 40 MW5MW6.GPJ; 1/2/2008 MW-6

URS

Project: SWMU 40 Groundwater Investigation - 2007
Project Location: Radford Army Ammunition Plant
Project Number: 21354880.10001

Log of Borehole MW-6

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Diagram	FIELD NOTES AND WELL DETAILS
						SHALE	SHALE, dry, no apparent odor.		
	105						10YR 7/1 light gray shaley LIMESTONE, dry, no apparent odor.		3/8-inch Hydrated Bentonite Pellets
	110						Fractured SHALE, dry.		No. 2 Silica Quartz Sandpack
	115						LIMESTONE, fractured clayey layer at 114 - 115 feet.		
						CL	CLAY		
	120						10YR 6/3 pale brown LIMESTONE, moderately moist, no apparent odor.		
						CL	CLAY and broken rock, wet, water entering hole at this interval.		
	125								Screen: 0.01-inch Factory Slotted, Sch 40, 2-inch PVC
	130						LIMESTONE, moist, no apparent odor.		
	135								

URS

Project: SWMU 40 Groundwater Investigation - 2007
Project Location: Radford Army Ammunition Plant
Project Number: 21354880.10001

Log of Borehole MW-6

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES	SAMPLES	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Diagram	FIELD NOTES AND WELL DETAILS
140							Boring terminated at 135 feet below ground surface.		
145									
150									
155									
160									
165									
170									

URS

APPENDIX C.4

WELL DEVELOPMENT FORMS

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MONITORING WELL INSPECTION LOG

PROJECT NAME: SWMU 40 Groundwater Investigation

URS PROJECT NO. ~~21354~~ 21354880.10001

FACILITY NAME: RFAAP

MONITORING WELL: 40MW2

A. Inspected by (full name): Jim Carter

B. Date/Time of Inspection: 7-31-07 1440

C. Inspection Observations:

1. Locking protective casing:
   Rusty but overall good.
2. Concrete well Pad:
   Good
3. Lock:
   no lock - new lock placed on well on 8/1/07
4. Erosion:
   None observed
5. Exterior well identification number:
   worn but readable

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

MONITORING WELL INSPECTION LOG

PROJECT NAME: SWMU 40 Groundwater Investigation

URS PROJECT NO. 21354880.10001

FACILITY NAME: RFAAP

MONITORING WELL: 40MW4

A. Inspected by (full name): ~~B~~ Jim Carter

B. Date/Time of Inspection: 7/31/07 1445

C. Inspection Observations:

1. Locking protective casing:
   Rusty but overall good
2. Concrete well Pad:
   Good
3. Lock:
   No lock - new lock placed on well on 8/1/07
4. Erosion:
   none observed
5. Exterior well identification number:
   worn but legible

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____
_____
_____
_____

F. Repair/remediation Date: _____

MONITORING WELL INSPECTION LOG

PROJECT NAME: SWMU 40 Groundwater Investigation

URS PROJECT NO. 21354880.10001

FACILITY NAME: RFAAP

MONITORING WELL: 40MW5 4

A. Inspected by (full name): Jim Carter

B. Date/Time of Inspection: 07/31/07 14:25

C. Inspection Observations:

1. Locking protective casing:
   New
2. Concrete well Pad:
   New
3. Lock:
   New
4. Erosion:
   none observed
5. Exterior well identification number:
   In new condition, legible

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

Field Well Development Measurement Log

Project Information

Project Name:	SWMU 40 Groundwater Investigation	Event:	
Facility Name:	REAAP	Date:	08/01/07
URS Project No.:	21354880.10001	Facility	SWMU 40
Weather Conditions:	Overcast, ~85°F	Well ID:	40MW5
Development Team:	CF, JC		

Purge Data

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

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)	DTW (ft)
1150	3,000		muddy	6.06	16.52	0.574	19.11	284	OR	106.28
1152										
1154	↓	18,000	↓	14.50	14.50	0.576	13.36	213	OR	109.62
Lost flow - water still in well - pulled pump up ~3ft										
1225	2,000	12,000	cloudy	7.15	15.34	0.580	11.25	106	139	105.76
1227			↓							
1229			Clear	7.10	15.57	0.575	10.74	109	68.5	
1231										
1233				7.10	15.80	0.576	10.54	127	58.4	
1235										
1237				7.11	16.15	0.576	10.30	141	40.7	
1239										
1241				7.13	16.07	0.566	10.28	148	23.9	
1243										
1245	↓	30,000		7.14	16.06	0.565	10.36	151	18.91	108.62
Lowered pump ~1.5 ft										
1250		60,000	cloudy	7.17	16.20	0.568	10.51	143	261	108.80
1252			clear							
1254				7.18	16.13	0.566	10.47	118	20.7	
1256										
1258				7.18	16.18	0.578	10.47	141	13.48	108.84
1300		70000								
Lowered pump ~ 0.75ft										
1302	2000		↓	7.20	16.19	0.579	10.22	151	11.44	108.83
1304			cloudy							
1306			Clear	7.18	16.23	0.577	10.29	147	127	
1308			↓	7.19	16.16	0.578	10.23	137	7.09	
1312	↓	80,000	muddy	7.19	16.07	0.580	10.07	143	—	109.25
water level probe stuck on ft 6.49 - had to adjust										
1316	2,000	84,000	↓	7.19	16.28	0.573	9.57	126	163	110.55
1318			clear	7.20	15.51	0.578	9.96	131	51	
1320				7.19	15.13	0.580	10.67	136	—	111.10
1324				7.18	15.19	0.578	10.20	131	23.4	
1326										
1328				7.17	15.08	0.579	9.77	124	17.6	
1330				7.17	15.06	0.579	9.71	124	13.80	
1332				7.17	15.08	0.579	9.69	124	11.42	111.60
1334				7.17	15.07	0.580	9.66	125	—	
1336				7.17	15.06	0.579	9.58	126	11.11	
1340				7.17	15.07	0.579	9.57	126	9.95	
1342				7.17	15.01	0.579	9.56	127	9.39	
1344				7.18	15.07	0.579	9.51	128	9.04	
1346				7.17	15.05	0.579	9.51	127	8.60	
1348				7.18	15.10	0.579	9.49	128	8.33	111.75
1350	↓	144,000	↓	7.18	15.09	0.580	9.47	130	8.47	

Well Development Notes:

DTW = 100.60'
TD = 158.36

Final pH (SU)		Final Conductivity (µs):		Final Turbidity:	ntu
Final Temperature (°C)		Final DO:		Final ORP:	
				Date Completed:	
Well Locked At:		Signature of Samplers:			

GROUNDWATER WELL DEVELOPMENT FIELD LOG

Project Information

Project Name:	SWMU 40 Groundwater Invest.	Date:	8/1/07
Facility Name:	RFAAP	Client:	ATK
URS Project No.:	21354880.10001	Sampling Event:	
Weather Conditions:	Overcast, ~85°F		
Development Team:	CF, JE		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	40MW5	Organic Vapor Headspace:	2.4 ppm
Time Well Casing Unlocked:	1150	Combustible Gas:	%LEL
Well Stickup from Ground Surface (Inner Casing):	0.875 ft		
Well Stickup from Ground Surface (Outer Casing):	1.021 ft	Height of Water H_w [a-b]	57.76 ft
Depth to Water Top of Inner/outer casing:[a]	100.60 ft		
Depth to Immiscible Layer	NA ft	Measurement Technique:	
Thickness of Immiscible Layer	NA ft	Electronic water level meter	
Total Depth of Well From top of Inner/Outer Casing [b]:	158.36 ft	accurate to 1/100'	

Well Construction and Purge Volume Calculation

Screened Well [ ]

Boring Radius (r_b)	0.75	ft
Nominal Radius of Casing (r_c)	0.083	ft
Height of Sand Pack (h_s)	26	ft
Length of Screen	20	ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ 59.4 gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring		ft
r_c = radius of casing		ft
h_s = height of sand		ft
h_w = height of water		ft
r_b = radius of boring		ft
r_c = radius of casing		ft
h_s = height of sand		ft
h_w = height of water		ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]

Low Flow Purge/Low Flow Sampling: [ ]

Other: High Flow purge

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Well Development Equipment

Surge Block	[X]	[ ]
Air Lifting:	[X] – predevelopment	[ ]
Submersible Pump:	[ ]	[ ]
Bailer	[ ]	[ ]

Quantity of Water/Mud Lost

Lost During Drilling (+)	gal
Removed Prior to Well Insertion (-)	gal
Lost During Thk Fluid Placement (-)	gal
Added During Filter Pk Placement (-)	gal
Total Loss (-)	gal

Depth to Sediment

Before Well Development	158.36
After Completion of Well Develop. (24 hrs)	158.36

No Sediment

Field Well Development Measurement Log

Project Information

Project Name:	SWMU 40 Groundwater Investigation	Event:	
Facility Name:	RFAAP	Date:	08/01/07
URS Project No.:	21354880.10001	Facility	SWMU 40
Weather Conditions:	Overcast, ~85°F	Well ID:	40MW5
Development Team:	CF, JC		

Purge Data

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

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)	
1352	2,000		Clear	7.18	15.03	0.579	9.48	129	7.33	111.90
1354				7.18	15.06	0.580	9.46	129	7.06	
1356				7.18	14.99	0.580	9.46	131	6.81	
1358	↓	160,000	↓	7.18	15.09	0.580	9.43	132	6.39	112.05
Stopped the pump at			14:02							
Purged 255 gallons			from 40MW5							
At	1590,	DTW =	101.38	, TD=	158.37					
~~At 1550~~										

Well Development Notes:

Final pH (SU)	7.18	Final Conductivity (µs):	0.580	Final Turbidity:	6.39 ntu
Final Temperature (°C)	15.09	Final DO:	9.43	Final ORP:	132
				Date Completed:	8/1/07
Well Locked At:	15:05	Signature of Samplers:			

GROUNDWATER WELL DEVELOPMENT FIELD LOG

Project Information

Project Name: _____ Date: _____
Facility Name: _____ Client: _____
URS Project No.: _____ Sampling Event: _____
Weather Conditions: _____
Development Team: _____

Monitoring Well ID and Measurement Information

Monitoring Well ID: _____ Organic Vapor Headspace: _____ ppm
Time Well Casing Unlocked: _____ Combustible Gas: _____ %LEL
Well Stickup from Ground Surface (Inner Casing): _____ ft
Well Stickup from Ground Surface (Outer Casing): _____ ft Height of Water H_w [a-b] _____ ft
Depth to Water Top of Inner/outer casing:[a] _____ ft
Depth to Immiscible Layer _____ ft Measurement Technique: _____
Thickness of Immiscible Layer _____ ft
Total Depth of Well From top of Inner/Outer Casing [b]: _____ ft

Well Construction and Purge Volume Calculation

Screened Well [ ]
Boring Radius (r_b) _____ ft
Nominal Radius of Casing (r_c) _____ ft
Height of Sand Pack (h_s) _____ ft
Length of Screen _____ ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack
$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals
Water Level below Top of Sand Pack
$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:
r_b = radius of boring _____ ft
r_c = radius of casing _____ ft
h_s = height of sand _____ ft
h_w = height of water _____ ft
r_b = radius of boring _____ ft
r_c = radius of casing _____ ft
h_s = height of sand _____ ft
h_w = height of water _____ ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]
Low Flow Purge/Low Flow Sampling: [ ]
Other:

Open Bedrock Well [ ]
Radius of Open Borehole (r_b) _____ ft
Depth to Bottom of Overburden Casing _____ ft
Depth to Bottom of Well _____ ft
Length of Well Open to Bedrock _____ ft

Formula for Determining Purge Volume:
$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:
r_b = radius of boring _____ ft
h_w = height of water _____ ft
r_b = radius of boring _____ ft
h_w = height of water _____ ft

Well Development Equipment

Surge Block	[ ]	[ ]
Air Lifting:	[ ]	[ ]
Submersible Pump:	[ ]	[ ]
Bailer	[ ]	[ ]

Quantity of Water/Mud Lost

Lost During Drilling (+) _____ gal
Removed Prior to Well Insertion (-) _____ gal
Lost During Thk Fluid Placement (-) _____ gal
Added During Filter Pk Placement (-) _____ gal
Total Loss (-) _____ gal

Depth to Sediment

Before Well Development _____
After Completion of Well Develop. (24 hrs) _____

Daily Calibration Form MW-5

INITIAL CALIBRATION		FINAL CALIBRATION	
DATE:	01 AUG 07	DATE:	01 AUG 07
TIME:	1125	TIME:	1600

pH METER CALIBRATION Aurical Co. Auto Calibration Solution

CALIBRATION STANDARD REFERENCE NO: #5651, Exp 3/21/08

METER ID Horiba U-22 WQM

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
(4.0)	4.03	4.00	4.11

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: #5651 Exp 3/21/08

METER ID Horiba U-22 WQM

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
4.49	4.50	4.50	4.56

TEMPERATURE METER CALIBRATION

METER ID Horiba U-22 WQM

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER	0.39		
BOILING WATER			
OTHER amr	30.03	29.90	32.62

IDW collected at 1505

MW-5

Daily Calibration Form

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: #5651, Exp 3/21/08

METER ID Horiba U-22 WQM

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
0	0.0	0.0	20.7

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: #5651 Exp 3/21/08

METER ID Horiba U-22 WQM

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
233	261	260	237

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: #5651 Exp 3/21/08

METER ID Horiba U-22 WQM

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
(8.5-9.5)T	6.23	7.49	8.11

COMMENTS _____

SIGNATURE Jim Carter

MONITORING WELL INSPECTION LOG

PROJECT NAME: Skunk 40 Groundwater Investigation

URS PROJECT NO. 27354880.10001

FACILITY NAME: RFAAP

MONITORING WELL: 40MW6

A. Inspected by (full name): Jim Carter

B. Date/Time of Inspection: 7-31-07 14:20

C. Inspection Observations:

1. Locking protective casing:
   New
2. Concrete well Pad:
   New
3. Lock:
   New
4. Erosion:
   NA
5. Exterior well identification number:
   Clearly marked.

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

Field Well Development Measurement Log

Project Information

Project Name:	SWMU 40 Groundwater Investigation	Event:	
Facility Name:	RFAAP	Date:	7/31/07
URS Project No.:	21354880.10001	Facility	SWMU 40
Weather Conditions:	Overcast, ~85°F	Well ID:	40MW6
Development Team:	CF, JC		

Purge Data

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

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)	DTW (ft)
1643	2000	0	Cloudy							
1645	1500	4,000								
1647	1000	7,000								
1649				5.43	17.21	0.545	12.17	285	858	93.7
1651										
1653				~~6.65~~						
1655				6.68	16.16	0.515	11.02	245	91.3	
1657										
1659			Clear	~~6.7~~						
1701	↓	21,000	↓	6.76	16.26	0.518	9.96	203	35.0	93.60
1703	- Pulled	pump -	surged	well						
1735	9500	21000	orange cloudy							90.00
1737	1200	26,000		7.07	16.64	0.548	15.53	143	918	
1739	1000	28,400								
1741				6.94	16.52	0.522	12.52	145	657	
1743										
1745				6.90	16.61	0.544	11.22	147	297	94.24
1747										
1749				6.88	16.64	0.542	10.30	155	201	
1751			↓							
1753	↓	42,600	Clear	6.88	16.55	0.544	9.82	160	100	94.15
1755	Switched to	low flow								
1800	250	42,400	Clear	6.87	18.14	0.544	9.07	144	70.7	92.20
1802				6.85	18.45	0.543	8.79	141		
1804	↓	43,400		6.89	18.04	0.546	8.79	141	64.4	
1806	400	44,200		6.90	17.37	0.548	8.74	111		
1808	300			6.91	17.54	0.545	8.51	95	705	
1810				6.91	17.66	0.544	8.39	100		
1812				6.92	17.87	0.542	8.34	103	55.8	91.67
1814				6.93	17.71	0.545	8.36	108		
1816				6.94	17.99	0.543	8.20	113	43.2	
1818				6.95	17.26	0.549	8.29	113		
1820				6.95	17.27	0.546	8.21	112	31.9	
1822				6.95	17.47	0.545	8.10	109		
1824				6.95	17.63	0.544	8.02	108	25.2	
1826				6.96	17.74	0.544	7.99	108		
1828				6.97	17.85	0.547	7.96	110	21.6	
1830				6.97	18.03	0.545	7.91	112		
1832				6.97	18.03	0.545	7.89	114	17.35	
1834				6.98	18.04	0.546	7.86	114	14.79	
1836				6.98	17.89	0.547	7.87	115		
1838				6.98	17.61	0.549	7.90	114	13.95	
1840				6.98	17.53	0.548	7.88	113	11.61	
1842		55,600		6.98	18.07	0.543	7.75	114	10.40	
1844	↓	~~45,800~~	↓	6.98	17.60	0.549	7.79	115	9.74	91.51

Well Development Notes:

DTW = 90.29'

TD = 136.60'

Stopped at 1844 - turbidity < 10 NTU - have to leave facility by 19:00.

Final pH (SU)	6.98	Final Conductivity (µs):	0.549	Final Turbidity:	9.74 ntu
Final Temperature (°C)	17.60	Final DO:	7.79	Final ORP:	115
				Date Completed:	7/31/07
Well Locked At:	19:00	Signature of Samplers:			

GROUNDWATER WELL DEVELOPMENT FIELD LOG

Project Information

Project Name: _____ Date: _____
Facility Name: _____ Client: _____
URS Project No.: _____ Sampling Event: _____
Weather Conditions: _____
Development Team: _____

Monitoring Well ID and Measurement Information

Monitoring Well ID: _____ Organic Vapor Headspace: _____ ppm
Time Well Casing Unlocked: _____ Combustible Gas: _____ %LEL
Well Stickup from Ground Surface (Inner Casing): _____ ft
Well Stickup from Ground Surface (Outer Casing): _____ ft Height of Water H_w [a-b] _____ ft
Depth to Water Top of Inner/outer casing:[a] _____ ft
Depth to Immiscible Layer _____ ft Measurement Technique: _____
Thickness of Immiscible Layer _____ ft
Total Depth of Well From top of Inner/Outer Casing [b]: _____ ft

Well Construction and Purge Volume Calculation

Screened Well [ ]

Boring Radius (r_b) _____ ft
Nominal Radius of Casing (r_c) _____ ft
Height of Sand Pack (h_s) _____ ft
Length of Screen _____ ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring _____ ft
r_c = radius of casing _____ ft
h_s = height of sand _____ ft
h_w = height of water _____ ft
r_b = radius of boring _____ ft
r_c = radius of casing _____ ft
h_s = height of sand _____ ft
h_w = height of water _____ ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]
Low Flow Purge/Low Flow Sampling: [ ]
Other:

Open Bedrock Well [ ]

Radius of Open Borehole (r_b) _____ ft
Depth to Bottom of Overburden Casing _____ ft
Depth to Bottom of Well _____ ft
Length of Well Open to Bedrock _____ ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring _____ ft
h_w = height of water _____ ft
r_b = radius of boring _____ ft
h_w = height of water _____ ft

Well Development Equipment

Surge Block	[ ]	[ ]
Air Lifting:	[ ]	[ ]
Submersible Pump:	[ ]	[ ]
Bailer	[ ]	[ ]

Quantity of Water/Mud Lost

Lost During Drilling (+) _____ gal
Removed Prior to Well Insertion (-) _____ gal
Lost During Thk Fluid Placement (-) _____ gal
Added During Filter Pk Placement (-) _____ gal
Total Loss (-) _____ gal

Depth to Sediment

Before Well Development _____
After Completion of Well Develop. (24 hrs) _____

Field Well Development Measurement Log

Project Information

Project Name:	SWMU 40 Groundwater Investigation	Event:	
Facility Name:	RFAAP	Date:	8/1/07
URS Project No.:	21354880.10001	Facility	SWMU 40
Weather Conditions:	overcast, ~ 80°F	Well ID:	40MW6
Development Team:	CF, JC		

Purge Data

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

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)	DTW (ft)
934	—									91.18
936	3000		Cloudy	5.97	15.66	0.541	15.87	291	141	
938										
940	↓									
942	4000	73,600		6.75	15.01	0.550	12.10	254	135	
944										99.0
946										
948			↓	6.83	15.02	0.531	11.11	247	72.4	
950			Clear	6.87	15.00	0.552	10.51	241	35.8	
952										
954										
956				6.89	14.95	0.553	10.18	236	22.6	
958										
1000				6.91	14.98	0.552	9.85	230	14.0	
1002										
1004	↓	~~161,600~~	↓	6.94	15.05	0.554	9.57	224	10.09	100.1
1006	Backed off to		Low Flow	~350	mL/min					
1008	350	161,600	Clear							99.75
1010									7.16	95.63
1012				6.97	16.64	0.553	9.25	214	6.56	94.41
1014				6.98	16.96	0.553	9.18	215	6.84	93.61
1016				6.98	17.20	0.553	9.09	212	7.20	93.23
1018				6.99	17.45	0.553	9.06	207	6.27	93.10
1020				7.00	17.02	0.553	9.12	201	5.54	
1022				7.00	17.05	0.553	9.10	196	4.59	
1024				7.00	17.35	0.552	9.01	190	3.71	
1026	↓	168,350	↓	7.00	17.26	0.552	9.02	187	2.91	
Stopped pumping at 1026										92.90
Between 7/31/07 & 8/01/07, purged at total of ~ 53 gallons										

Well Development Notes:

Finishing development of 40MW6

Final pH (SU)		Final Conductivity (µs):		Final Turbidity:	ntu
Final Temperature (°C)		Final DO:		Final ORP:	
				Date Completed:	
Well Locked At:		Signature of Samplers:			

GROUNDWATER WELL DEVELOPMENT FIELD LOG

Project Information

Project Name:	SWMU 40 Groundwater Inv.	Date:	7/31/07 - 8/1/07
Facility Name:	RFAAP	Client:	ATK
URS Project No.:	21354880.10001	Sampling Event:	
Weather Conditions:	Overcast, ~85°F		
Development Team:	CF, JC		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	40MW6		Organic Vapor Headspace:	1.5	ppm
Time Well Casing Unlocked:	1620		Combustible Gas:		%LEL
Well Stickup from Ground Surface (Inner Casing):	0.81	ft			
Well Stickup from Ground Surface (Outer Casing):	0.92	ft	Height of Water H_w [a-b]	46.31	ft
Depth to Water Top of Inner/outer casing:[a]	90.29	ft			
Depth to Immiscible Layer	NA	ft	Measurement Technique:		
Thickness of Immiscible Layer	NA	ft	Electronic Water Level Meter		
Total Depth of Well From top of Inner/Outer Casing [b]:	136.60	ft	accurate to 1/100'		

Well Construction and Purge Volume Calculation

Screened Well [ ]

Boring Radius (r_b)	0.25	ft
Nominal Radius of Casing (r_c)	0.083	ft
Height of Sand Pack (h_s)	26	ft
Length of Screen	20	ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ 53.37 gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring		ft
r_c = radius of casing		ft
h_s = height of sand		ft
h_w = height of water		ft
r_b = radius of boring		ft
r_c = radius of casing		ft
h_s = height of sand		ft
h_w = height of water		ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]

Low Flow Purge/Low Flow Sampling: [ ]

Other: High Flow / Low Flow development

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)		ft
Depth to Bottom of Overburden Casing		ft
Depth to Bottom of Well		ft
Length of Well Open to Bedrock		ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring		ft
h_w = height of water		ft
r_b = radius of boring		ft
h_w = height of water		ft

Well Development Equipment

Surge Block	[X]		[ ]	
Air Lifting:	[X]	predevelopment	[ ]	
Submersible Pump:	[ ]		[ ]	
Bailer	[ ]		[ ]	

Quantity of Water/Mud Lost

Lost During Drilling (+)		gal
Removed Prior to Well Insertion (-)		gal
Lost During Thk Fluid Placement (-)		gal
Added During Filter Pk Placement (-)		gal
Total Loss (-)		gal

Depth to Sediment

Before Well Development	136.60
After Completion of Well Develop. (24 hrs)	136.60

little to no sediment after purging

INITIAL CALIBRATION	FINAL CALIBRATION
DATE: 7/31/07 ~~8/1/07~~	DATE: 8/1/07
TIME: ~~0930~~ 1640	TIME: 1030

pH METER CALIBRATION Aurical Co. Auto Cal solution

CALIBRATION STANDARD REFERENCE NO: Lot # 5651 Exp 03-21-08

METER ID Horiba U-22 WQM

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
(4.0)	3.93	4.01	4.09

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: #5651 Ex 3/21/08

METER ID Horiba U-22 WQM

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
4.49	4.53	4.49	4.43

TEMPERATURE METER CALIBRATION

METER ID Horiba U-22 WQM

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER	0.62		
BOILING WATER			
OTHER a.v	23.49	23.51	25.19

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: #5651 Exp 3/21/08

METER ID Horiba U-22 WQM

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
0.0	1.7	0.0	0.3

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: #5651 Exp 3/21/08

METER ID Horiba U-22 WQM

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
233	270	269	246

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: #5651 Exp 3/21/08

METER ID Horiba U-22 WQM

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
(8.5-9.5)T	7.82	8.57	7.52

COMMENTS _____

SIGNATURE Jim Carr

APPENDIX C.5

GROUNDWATER SAMPLE FORMS

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MONITORING WELL INSPECTION LOG

PROJECT NAME: SWMU 40 Groundwater Investigation

URS PROJECT NO. 21354880-10001

FACILITY NAME: RFAAP

MONITORING WELL: 17MW3

A. Inspected by (full name): Jim Carter

B. Date/Time of Inspection: 08/13/07 14:30

C. Inspection Observations:

1. Locking protective casing:
   Paint is peeling, slightly rusted but overall in decent condition.
2. Concrete well Pad:
   Fair condition - not broken or cracked
3. Lock:
   rusty but functional
4. Erosion:
   None observed
5. Exterior well identification number:
   Inside cap - difficult ~~too~~ to read. No number on the exterior

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

New number needed on exterior of well.
Although the lock is functional, a new lock is recommended.
NO WELL CAP

F. Repair/remediation Date: _____

27.5 - 3

Set pump on bottom, then pulled up ~8-9 ft.

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	SWMU46 GW Investigation	Date:	08/03/07
Facility Name:	RFAAP	Client:	ATK/RFAAP
URS Project No.:	21354880.~~8~~8001	Sampling Event:	
Weather Conditions:	Partly cloudy, ~90°F		
Sampling Team:	CF, JC		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	17MW3	Organic Vapor Headspace:	0.2 ~~0.07~~ ppm
Time Well Casing Unlocked:	14:20	Combustible Gas:	%LEL
Well Stickup from Ground Surface (Inner Casing):	2 3 5/8" ft		
Well Stickup from Ground Surface (Outer Casing):	27.5" ft	Height of Water H_w [a-b]	34.76 ft
Depth to Water Top of Inner/outer casing:[a]	~~23 147.99~~ ft		
Depth to Immiscible Layer	NA ft	Measurement Technique:	
Thickness of Immiscible Layer	NA ft	Solinst M101 water Level meter	
Total Depth of Well From top of Inner/Outer Casing [b]:	182.75 ft	accurate to 1/100'	

Well Construction and Purge Volume Calculation

Screened Well [ ]

Boring Radius (r_b)	0.33	ft
Nominal Radius of Casing (r_c)	0.167	ft
Height of Sand Pack (h_s)	22	ft
Length of Screen	20	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [✓]
Low Flow Purge/Low Flow Sampling: [ ]
Other:

Formulas for Determining Purge Volume

h_w = 34.76

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring		ft
r_c = radius of casing		ft
h_s = height of sand		ft
h_w = height of water		ft
r_b = radius of boring		ft
r_c = radius of casing		ft
h_s = height of sand		ft
h_w = height of water		ft

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring		ft
h_w = height of water		ft
r_b = radius of boring		ft
h_w = height of water		ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump: Grundfos	[✓]		[ ]
Peristaltic Pump:	[ ]		[ ]

$[[(\pi \times 0.33^2 \times 22) - (\pi \times 0.167^2 \times 22)] \times 0.3 + (\pi \times 0.167^2 \times 22)] \times 7.5$

$(7.52 - 1.92) \times 3 + 3.04$

$(1.68 + 3.04) = 4.72 \times 7.5 \quad 35.4 \times 3 = 106.2$

Field Groundwater Monitoring Log

Project Information

Project Name: SWMU 40 GW Investigation
Facility Name: RFAAP
URS Project No.: 21354880.00001
Weather Conditions: Partly cloudy, ~90°F
Sampling Team: CF ~~JC~~ JC

Event:
Date: 08/13/07
Facility
Well ID: 17MW3

Purge Data

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

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms) (+/- 3%)	DO (mg/L) (10%)	ORP (mV) (10)	Turbidity (ntu) (10%)	
1600	~~2700~~	2700	C	cloudy	6.17	14.14	1.02	7.61	98	40.4	153.9
1605	2700			cloudy	6.17	14.26	1.01	8.99	95	—	155.9
1610	2700			cloudy	—	—	—	—	—	—	156.41
1625	1500			cloudy	6.45	15.44	0.760	11.16	44	93.3	159.40
1630	1500			clearer	6.50	16.35	0.802	10.46	45		159.62
1635	1000			clear	6.46	15.91	0.851	10.09	54	32.3	159.55
1640	1000			clear	6.43	16.46	0.916	9.17	61	29.4	159.41
1645	1000			clear	~~6.45~~	16.41	0.939	6.25	65	24.6	159.37
1650	1000			clear	6.41	16.41	0.962	5.99	65	17.67	159.28
1655	1000			clear	6.40	16.50	0.996	5.73	64	15.88	159.25
1700	1000			clear	6.40	16.75	0.96	5.59	65	11.56	159.21
1705	1,000			clear	6.40	16.81	0.97	5.50	64	10.42	159.17
1710	1,000			clear	6.40	16.58	0.99	5.41	66	8.76	159.14
1720	500			clear	6.41	16.70	1.00	8.87	69	8.53	158.70
1725	500			clear	6.41	16.51	1.00	8.48	71	7.40	158.30
1726	500			clear	6.41	16.11	1.00	8.35	69	6.84	158.00
1729	500			clear	6.41	16.12	1.01	8.16	69	6.36	157.94
1732	500			clear	6.41	16.49	1.01	7.72	68	6.14	157.77
1735	500			clear	6.41	17.08	1.01	7.22	67	6.19	157.60
1738	500			clear	6.41	17.01	1.02	6.96	65	5.98	157.50
1741	500			clear	6.41	17.19	1.02	6.68	66	5.26	157.48
1744	500			clear	6.41	17.14	1.02	6.48	68	4.81	157.47
1747	500			clear	6.41	17.21	1.02	6.28	68	4.80	157.43
1750	500			clear	6.41	17.23	1.02	6.08	68	4.33	157.38
1753	500			clear	6.41	17.05	1.03	5.90	69	4.14	157.35
1756	500			clear	6.41	17.06	1.03	5.81	68	3.45	157.32
1759	500			clear	6.41	17.15	1.03	5.74	68	3.43	

Sampling Data

Monitoring Well ID: 17MW3
Sample Collection Time: ~~16~~ 18:05

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

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)	(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)	(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide	(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)		
PCBs		(1 liter, amber glass, 4°C)		
PAHs		(1 liter, amber glass, 4°C)		
Explosives		(1 liter, amber glass, 4°C)		
Perchlorate		(125 ml, plastic, 4°C)		
Dioxin/Furans		(1 liter, amber glass, 4°C)		
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)		

Comments:

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

Final pH (SU): 6.41
Final Temperature (°C): 17.16
Final Conductivity (µs): 1.03
Final DO: 5.65
Final Turbidity: 3.41 ntu
Final ORP: 67
Date Completed: 08/17/07

Well Locked At:
Signature of Samplers: Jim Carter

17 MW3

Daily Calibration Form

INITIAL CALIBRATION	FINAL CALIBRATION
DATE: 08/13/07	DATE: 8/13/2007
TIME: 14:55	TIME: 18:30

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
(4.0)	4.09	4.00	4.02

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
4.49	4.63	4.51	4.70

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER n.r	31.37	31.61	25.69

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
0.0	-2.9	-0.8	5.3

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	193	193	199

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	6.56	7.66	9.09

COMMENTS_____

SIGNATURE_____

MONITORING WELL INSPECTION LOG

PROJECT NAME: SWMU 40 GW INVESTIGATION

URS PROJECT NO. 21354880.10001

FACILITY NAME: RFAAP

MONITORING WELL: 40MW3

A. Inspected by (full name): Jim Carter

B. Date/Time of Inspection: 08/14/07 0910

C. Inspection Observations:

1. Locking protective casing:
   No Lock - casing is rusted but overall in good shape. No cap on inner well casing
2. Concrete well Pad:
   Good
3. Lock:
   No Lock
4. Erosion:
   None Observed
5. Exterior well identification number:
   Present but well ID is illegible

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:
Needs a lock and interior well cap. Needs well ID

F. Repair/remediation Date: _____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	SWMU 40 GW Investigation	Date:	08/14/07
Facility Name:	RFAAP	Client:	ARK/RFAAP
URS Project No.:	27654880.10001	Sampling Event:	
Weather Conditions:	Clear, ~75°F		
Sampling Team:			

Monitoring Well ID and Measurement Information

Monitoring Well ID:	40MW3		Organic Vapor Headspace:	0.7 ppm
Time Well Casing Unlocked:	0910		Combustible Gas:	%LEL
Well Stickup from Ground Surface (Inner Casing): ~2'	24 1/8"	ft		
Well Stickup from Ground Surface (Outer Casing):	26 3/8"	ft	Height of Water H_w [a-b]	26.5 ft
Depth to Water Top of Inner/outer casing: [a]	94.02	ft		
Depth to Immiscible Layer	NA	ft	Measurement Technique:	
Thickness of Immiscible Layer	NA	ft	Solinst M101 Water Level Meter	
Total Depth of Well From top of Inner/Outer Casing [b]:	120.52	ft	accurate to 1/100 ft	

Well Construction and Purge Volume Calculation

Screened Well [✓]

Boring Radius (r_b)	0.33	ft
Nominal Radius of Casing (r_c)	0.167	ft
Height of Sand Pack (h_s)	22	ft
Length of Screen	20	ft

Assuming 8" boring diameter

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ 90 gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring		ft
r_c = radius of casing		ft
h_s = height of sand		ft
h_w = height of water		ft
r_b = radius of boring		ft
r_c = radius of casing		ft
h_s = height of sand		ft
h_w = height of water		ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [✓]

Low Flow Purge/Low Flow Sampling: [ ]

Other:

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring		ft
h_w = height of water		ft
r_b = radius of boring		ft
h_w = height of water		ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump: Grundfos	[✓]		[ ]
Peristaltic Pump:	[ ]		[ ]

$([[(7.53 - 1.93) \times .3] + 2.32) \times 7.5$

$7.5(1.68 + 2.32) = 30 \times 3 = 90$ gal

Field Groundwater Monitoring Log

Project Information

Project Name:	SWMU 40 GW Investigation	Event:	
Facility Name:	RFAAP SWMU 40	Date:	08/14/07
URS Project No.:	21354880.10001	Facility	
Weather Conditions:	Clear, ~75-80°F at 9:00 AM	Well ID:	40MW3
Sampling Team:	JC, CF		

Purge Data

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

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)	
1002	1,000		Clear	6.17	15.30	0.566	9.05	105	6.38	94.54
1007	1300	5000	clear	6.45	15.63	0.562	9.10	95	4.64	94.58
1012	1500		Clear	6.51	15.65	0.560	9.08	95	5.53	94.65
1017	1500	~~5,300~~	Clear	6.55	15.56	0.559	9.99	101	4.88	901.65
1022	2,000		clear	6.58	15.21	0.558	8.95	108	2.34	95.02
1027	2,000		clear	6.60	15.26	0.557	8.83	116	1.13	95.09
1032	2,~~500~~		clear	6.62	15.06	0.555	8.89	121	1.57	95.31
1037	2,500		Clear	6.63	14.93	0.554	8.81	121	0.91	95.52
1042	2500		Clear	6.65	14.82	0.553	8.76	100	1.10	95.68
1047	2,500		clear	6.66	14.68	0.553	8.74	100	0.84	95.90
1052	2,500		clear	6.67	14.62	0.552	8.71	99	0.74	95.93
1057	2,500		Clear	6.68	14.63	0.551	8.72	96	0.76	95.93
1102	2,500		Clear	6.69	14.63	0.549	8.68	91	0.78	95.93
1110	2,500		Clear	6.70	14.67	0.547	8.63	87	0.78	95.93
1115	2,500		Clear	6.71	14.63	0.547	8.63	86	0.59	95.94
1120	2,500		Clear	6.72	14.65	0.545	8.69	85	0.55	95.94
1125	2,500		Clear	6.72	14.69	0.543	8.65	83	0.70	95.94
1130	2,500		Clear	6.73	14.66	0.541	8.70	79	0.86	95.92
1135	2,500		Clear	6.73	14.67	0.537	8.52	81	0.55	95.92
1140	2,500		Clear	6.74	14.72	0.535	8.49	82	0.50	95.92
1150	2,500		Clear	6.75	14.69	0.542	8.51	83	0.85	95.92
1155	2,500		Clear	6.75	14.72	0.541	8.51	86	0.54	95.92
1200	2,500		Clear	6.75	14.75	0.540	8.47	85	0.54	95.91
1205	2,500		Clear	6.75	14.74	0.539	8.47	80	0.66	95.91
1210	2,500		Clear	6.76	14.81	0.537	8.47	82	0.43	95.91
1215	2,500		Clear	6.76	14.78	0.535	8.47	84	0.43	95.91
Switched to Low Flow - see sheet 2							450 mL/min			

One 55 gal Drum

Purged ~ 90 gal

Sampling Data

Monitoring Well ID: 40MW3 Sample Collection Time:

Sampling Device:

Dedicated Bladder Pump: Peristaltic Pump:
Dedicated Submersible Pump: Dedicated Bailer:
Submersible Pump: Grundfos Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)			
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives		(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

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

Final pH (SU): Final Conductivity (µs): Final Turbidity: ntu
Final Temperature (°C): Final DO: Final ORP:
Date Completed:

Well Locked At: Signature of Samplers:

Field Groundwater Monitoring Log

Project Information

Project Name: SWMU 40 GW Investigation
Facility Name: RFAAP SWMU 40
URS Project No.: 21354880.10001
Weather Conditions: Clear ~85° (at noon)
Sampling Team: JC, CF

Event:
Date: 08/14/07
Facility
Well ID: 40MW3

Purge Data

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

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)	
1225	450		clear	6.77	15.43	0.537	8.51	73	1.24	94.38
1228	450		clear	6.77	15.75	0.536	8.46	65	1.40	94.37
1231	450		clear	6.77	16.36	0.536	8.39	67	0.99	94.35
1234	450		clear	6.77	16.62	0.536	8.38	64	1.13	94.33
1237	450		clear	6.77	16.62	0.536	8.46	62	1.39	94.30
1240	450		clear	6.77	16.63	0.536	8.48	57	2.70	94.29
1243	450		clear	6.77	16.71	0.536	8.45	56	2.39	94.30
1246	450		clear	6.77	16.95	0.537	8.40	55	1.93	94.30
1249	450		clear	6.77	17.02	0.537	8.42	58	1.73	94.30
1252	450		clear	6.77	17.15	0.537	8.44	59	1.63	94.30
1255	450		clear	6.77	17.20	0.543	8.44	59	1.83	94.30

Sampling Data

Monitoring Well ID: 40 MW3
Sample Collection Time: 13:00
EQBK1 Sampled at 1405

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

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)	(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)	(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide	(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)		
PCBs		(1 liter, amber glass, 4°C)		
PAHs		(1 liter, amber glass, 4°C)		
Explosives		(1 liter, amber glass, 4°C)		
Perchlorate		(125 ml, plastic, 4°C)		
Dioxin/Furans		(1 liter, amber glass, 4°C)		
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)		

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [✓]Yes [ ]No
Final pH (SU): 6.77
Final Temperature (°C): 17.34
Final Conductivity (µs): 0.543
Final DO: 8.41
Final Turbidity: 1.79 ntu
Final ORP: 58
Date Completed: 08/14/07
Well Locked At: 1330
Signature of Samplers: Jim Carter

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name: _____ Date: _____
Facility Name: _____ Client: _____
URS Project No.: _____ Sampling Event: _____
Weather Conditions: _____
Sampling Team: _____

Monitoring Well ID and Measurement Information

Monitoring Well ID: _____ Organic Vapor Headspace: _____ ppm
Time Well Casing Unlocked: _____ Combustible Gas: _____ %LEL
Well Stickup from Ground Surface (Inner Casing): _____ ft
Well Stickup from Ground Surface (Outer Casing): _____ ft Height of Water H_w [a-b] _____ ft
Depth to Water Top of Inner/outer casing:[a] _____ ft
Depth to Immiscible Layer _____ ft Measurement Technique: _____
Thickness of Immiscible Layer _____ ft
Total Depth of Well From top of Inner/Outer Casing [b]: _____ ft

Well Construction and Purge Volume Calculation

Screened Well [ ]
Boring Radius (r_b) _____ ft
Nominal Radius of Casing (r_c) _____ ft
Height of Sand Pack (h_s) _____ ft
Length of Screen _____ ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack
$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack
$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:
r_b = radius of boring _____ ft
r_c = radius of casing _____ ft
h_s = height of sand _____ ft
h_w = height of water _____ ft
r_b = radius of boring _____ ft
r_c = radius of casing _____ ft
h_s = height of sand _____ ft
h_w = height of water _____ ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]
Low Flow Purge/Low Flow Sampling: [ ]
Other:

Open Bedrock Well [ ]
Radius of Open Borehole (r_b) _____ ft
Depth to Bottom of Overburden Casing _____ ft
Depth to Bottom of Well _____ ft
Length of Well Open to Bedrock _____ ft

Formula for Determining Purge Volume:
$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:
r_b = radius of boring _____ ft
h_w = height of water _____ ft
r_b = radius of boring _____ ft
h_w = height of water _____ ft

Purge Equipment

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

Daily Calibration Form

40MW3

INITIAL CALIBRATION	FINAL CALIBRATION
DATE: 08/14/07	DATE: 8/14/2007
TIME: 0940	TIME: 14:00

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
4.0	4.0	4.02	3.76

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	4.56	4.51	4.55

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER Air	29.48	29.79	35.56

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	0.19	0.1	-5.8

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	203	202	236

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	8.18	7.97	6.98

COMMENTS_____

SIGNATURE_____

MONITORING WELL INSPECTION LOG

PROJECT NAME: SWMU 40 GW Investigation

URS PROJECT NO. 21354880.10001

FACILITY NAME: RFAAP - SWMU 40

MONITORING WELL: 40MW5

A. Inspected by (full name): ~~New~~ Jim Carter

B. Date/Time of Inspection: ~~New~~ 8/15/07 0920

C. Inspection Observations:

1. Locking protective casing:
   New
2. Concrete well Pad:
   New
3. Lock:
   New
4. Erosion:
   New
5. Exterior well identification number:
   New

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

$24\frac{3}{8} - 3\frac{5}{8}$ Set pump at ~ 145' btoc

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	SWMU40 GW Investigation	Date:	08/15/07
Facility Name:	RFAAP	Client:	ATK/RFAAP
URS Project No.:	21354880.10001	Sampling Event:	
Weather Conditions:	Clear ~ 80°F @ 9:24		
Sampling Team:	JC, CF		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	40MW5	Organic Vapor Headspace:	5.2 ppm
Time Well Casing Unlocked:	0925	Combustible Gas:	%LEL
Well Stickup from Ground Surface (Inner Casing):	$20\frac{3}{4}$" ft		
Well Stickup from Ground Surface (Outer Casing):	$24\frac{3}{8}$" ft	Height of Water H_w [a-b]	55.62 ft
Depth to Water Top of Inner/outer casing:[a]	102.77 ft		
Depth to Immiscible Layer	NA ft	Measurement Technique:	
Thickness of Immiscible Layer	NA ft		
Total Depth of Well From top of Inner/Outer Casing [b]:	~~102.77~~ ft 158.39		

Well Construction and Purge Volume Calculation

Screened Well [✓]

Boring Radius (r_b)	0.25 ft
Nominal Radius of Casing (r_c)	0.083 ft
Height of Sand Pack (h_s)	26 ft
Length of Screen	20 ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]

Low Flow Purge/Low Flow Sampling: [ ]

Other:

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump: Grundfos	[✓]		[ ]
Peristaltic Pump:	[ ]		[ ]

$3 \times (((\pi \times 0.25^2 \times 26) - (\pi \times 0.083^2 \times 26)) \times 0.3 + (\pi \times 0.083^2 \times 55.62)) \times 7.5$

$(5.10 - 0.56) \times 3 + (1.2)$

$(1.362 + 1.2) \times 7.5 = 19.215 \times 3$ 57.65 gal

48 total drums on site 17 MW3=1
this trip 5 water 1 PPE 40MW3 = 2
40MW5=1 40MW67=1

Field Groundwater Monitoring Log

Project Information

Project Name:	SWMU40 Groundwater Investigation	Event:	
Facility Name:	RFAAP/SWMU40	Date:	08/15/07
URS Project No.:	21354660.10001	Facility	SWMU40
Weather Conditions:	Clear, ~80°F @ 9:24	Well ID:	40MW5
Sampling Team:	CF, JC		

Purge Data

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

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)	DTW (ft)
1014	2000	0	Cloudy	5.94	13.06	0.700	9.52	166	63.9	107.20
1019	2000	10,000	Cloudy	6.20	14.79	0.697	9.07	105	89.8	109.48
1024	2000	20,000	Cloudy	6.34	15.17	0.696	8.12	93	69.1	110.50
1029	2500	30,000	Clear	6.40	15.31	0.697	7.56	89	37.0	111.49
1034	2500	42,500	Clear	6.45	15.12	0.696	7.18	90	40.5	112.70
1039	2500	55,000	Clear	6.49	15.15	0.697	6.84	88	27.8	113.20
1044	2500	67,500	Clear	6.51	15.15	0.698	6.76	87	23.1	113.50
1049	2500	80,000	Clear	6.55	15.14	0.698	6.63	83	15.88	113.70
1054	2500	92,500	Clear	6.57	15.15	0.698	6.60	83	13.68	113.70
1059	3000	105,000	Clear	6.63	14.86	0.698	6.43	69	16.00	116.15
1104	3000	120,000	Clear	6.65	14.86	0.698	6.58	68	18.20	116.70
1109	3000	135000	Clear	6.66	14.85	0.699	6.61	66	13.16	117.05
1114	3000	150,000	Clear	6.66	14.83	0.699	6.64	76	10.36	117.30
1119	3000	165,000	Clear	6.67	14.79	0.699	6.63	78	9.41	117.58
1124	3,000	180,000	Clear	6.68	14.79	0.699	6.62	79	6.00	117.74
1129	3,000	195,000	Clear	6.68	14.78	0.699	6.61	82	5.62	117.90
1136	500	210,000	Clear	6.69	14.96	0.698	6.50	88	8.60	111.05
1139	500	217,500	Clear	6.69	15.21	0.701	6.48	54	6.41	109.9
1142	500	213,000	Clear	6.69	15.42	0.702	6.48	35	13.86	109.35
1145	500	214,500	Clear	6.69	15.57	0.700	6.50	50	5.35	108.48
1148	500	216,000	Clear	6.69	15.50	0.700	6.49	61	2.87	108.20
1151	500	217,500	Clear	6.69	15.41	0.699	6.49	64	2.23	107.62
1154	500	219,000	Clear	6.69	15.21	0.698	6.53	67	1.51	107.45
1157	500	220,500	Clear	6.68	15.01	0.698	6.51	77	0.71	107.30
1200	500	222,000	Clear	6.68	15.02	0.698	6.49	82	0.65	107.23
1203	500	223,500	Clear	6.67	15.04	0.698	6.49	86	0.58	107.19
1206	500	225,000	Clear	6.67	15.07	0.698	6.50	91	0.47	107.17
1209	500	226,500	Clear	6.67	15.08	0.698	6.49	92	0.54	107.17

Switched to low flow (~500 mL/min) at 11:29

~5 bad parsed

Sampling Data

Monitoring Well ID: 40MW5
Sample Collection Time: 12:15
Also MS/MSD, DUP-1

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

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)			
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives		(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

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

Final pH (SU)	6.67	Final Conductivity (µs):	0.697	Final Turbidity:	0.55 ntu
Final Temperature (°C)	15.13	Final DO:	6.50	Final ORP:	93
				Date Completed:	8/14/07
Well Locked At:		Signature of Samplers:	Jim Carter		

40 MW5

INITIAL CALIBRATION	FINAL CALIBRATION
DATE: 08/15/07	DATE: 8/15/2007
TIME: 09:40	TIME: 14:00

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
4.0	4.23	4.01	4.05

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	4.43	4.49	4.33

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER amb	22.06	22.15	29.61

Cell W-23 XD
~~MFG~~ MFG NO. 2015016

Daily Calibration Form

40 MWS

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	~~4.7~~ -0.6	0.0	-1.3

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	211	210	208

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	9.10	8.75	8.46

COMMENTS_____

SIGNATURE Jim Carter

MONITORING WELL INSPECTION LOG

PROJECT NAME: SWMU 40 Groundwater Investigation

URS PROJECT NO. 21354880.10001

FACILITY NAME: RFAAP

MONITORING WELL: 40 MW6

A. Inspected by (full name): Jim Carter

B. Date/Time of Inspection: 08/14/07 / 17:15

C. Inspection Observations:

1. Locking protective casing:
   New
2. Concrete well Pad:
   New
3. Lock:
   New
4. Erosion:
   NONE
5. Exterior well identification number:
   NEW

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

Pump should be placed at 122 ft (water + flow bgs) + 19" (casing height above ground) ≈ 124 ft btoc

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	SWMU40 GW Investigation	Date:	08/14/07
Facility Name:	RFAAP	Client:	ATK/RFAAP
URS Project No.:	21354880.10001	Sampling Event:	
Weather Conditions:	Clear, ~85°F (17:15)		
Sampling Team:	CF, JC		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	40MW6	Organic Vapor Headspace:	1.5 ppm
Time Well Casing Unlocked:	17:19	Combustible Gas:	%LEL
Well Stickup from Ground Surface (Inner Casing):	19" ft		
Well Stickup from Ground Surface (Outer Casing):	21.75" ft	Height of Water H_w [a-b]	42.11 ft
Depth to Water Top of (Inner)/outer casing:[a]	~~19"~~ 94.89 ft		
Depth to Immiscible Layer	NA ft	Measurement Technique:	
Thickness of Immiscible Layer	NA ft		
Total Depth of Well From top of Inner/Outer Casing [b]:	136.70 ft		

Well Construction and Purge Volume Calculation

Screened Well [✓]

Boring Radius (r_b)	0.25	ft
Nominal Radius of Casing (r_c)	0.083	ft
Height of Sand Pack (h_s)	26	ft
Length of Screen	20	ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring		ft
r_c = radius of casing		ft
h_s = height of sand		ft
h_w = height of water		ft
r_b = radius of boring		ft
r_c = radius of casing		ft
h_s = height of sand		ft
h_w = height of water		ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [✓]

Low Flow Purge/Low Flow Sampling: [ ]

Other:

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring		ft
h_w = height of water		ft
r_b = radius of boring		ft
h_w = height of water		ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump: Grundfos	[✓]		[ ]
Peristaltic Pump:	[ ]		[ ]

$((\pi \times 0.25^2 \times 26) - (\pi \times 0.083^2 \times 26)) \times 0.3 + (\pi \times 0.083^2 \times 42.11)) \times 7.5$

$((5.11 - 0.56) \times 0.3 + (0.91)) \times 7.5$

$(1.365 + 0.91) \times ~~0.7~~ 7.5 = (2.275) \times 7.5 = 17.1$

3 vol = 51.19 gal

Started pump at 17:56
Purged ~54 gallons

Field Groundwater Monitoring Log

Project Information

Project Name:	SWMU40 GW Investigation	Event:	
Facility Name:	RFAAP	Date:	08/14/07
URS Project No.:	21354880.10001	Facility	RFAAP SWMU40
Weather Conditions:	Clear, ~85°F 17:55	Well ID:	40MW6
Sampling Team:	CF, JC		

Purge Data

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

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)	
1800	3000		Cloudy	5.98	14.36	0.671	7.28	173	60.7	98.64
1805	2200	15,000	cloudy	6.22	15.09	0.665	6.61	150	41.3	99.22
1810	2200	26,000	clear	~~6.75~~ 6.53	15.21	0.666	6.78	140	—	99.40
1815	2300	37,000	clear	6.54	14.99	0.666	6.81	134	15.62	100.41
1820	3,000		Clear	6.43	15.04	0.667	6.69	128	12.27	100.74
1825	3,000		Clear	6.47	15.03	0.667	6.77	120	7.43	100.94
1830	3,000		Clear	6.49	15.04	0.667	6.74	117	5.66	101.06
1835	3,000	97,000	Clear	6.52	15.05	0.668	6.74	118	4.37	101.20
1840	3,000		Clear	6.53	15.03	0.668	6.72	121	3.68	101.24
1845	3,000		Clear	6.55	15.06	0.668	6.71	122	2.34	101.27
1850	3,000		Clear	6.56	15.07	0.668	6.69	124	2.14	101.34
1855	3,000	157,000	Clear	6.57	15.07	0.668	6.64	118	2.08	101.41
1900	3,000		Clear	6.57	15.07	0.669	6.63	109	1.74	101.44
1905	3,000	187,000	Clear	6.58	15.12	0.668	6.64	104	1.68	101.48
1910	3,000		Clear	6.58	15.12	0.668	6.58	95	1.60	101.50
Switched to low flow at 1910					~456 mL/min					~~97.69~~
1915	450		Clear	6.60	15.25	0.670	6.53	106	1.93	97.69
1918	450		Clear	6.59	15.56	0.668	6.38	99	0.82	97.48
1921	450		Clear	6.59	16.02	0.667	6.41	96	0.77	97.36
1924	450		Clear	6.59	16.27	0.668	6.45	93	0.65	97.25
1927	450		Clear	6.60	16.30	0.668	6.48	97	0.59	97.17
1930	450		Clear	6.60	16.35	0.667	6.47	102	0.44	97.13
1933	450		Clear	6.61	16.37	0.667	6.50	101	0.54	97.10
1936	450		Clear	6.61	16.36	0.667	6.50	98	0.50	97.08

Sampling Data

Monitoring Well ID: 40MW6
Sample Collection Time: 19:40

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

Sample Containers/Preservatives

VOCs	✓	(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)	✓	(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs	✓	(1 liter, amber glass, 4°C)	Metals (F)	✓	(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)			
PCBs	✓	(1 liter, amber glass, 4°C)			
PAHs	✓	(1 liter, amber glass, 4°C)			
Explosives	✓	(1 liter, amber glass, 4°C)			
Perchlorate	✓	(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			
Comments:					

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

Final pH (SU)	6.61	Final Conductivity (µs):	0.667	Final Turbidity:	0.48 ntu
Final Temperature (°C)	16.36	Final DO:	6.50	Final ORP:	99
Well Locked At:	19:58	Signature of Samplers:	Jim Carter	Date Completed:	08/14/07

40 MW 6

INITIAL CALIBRATION	FINAL CALIBRATION
DATE: 08/14/07	DATE: 08/14/07
TIME: 17:50	TIME: 19:50

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
(4.0)	3.76	4.03	4.22

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	4.55	4.53	4.38

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER air	35.56	35.35	23.10

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	-5.8	-4.9	2.3

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	236	233	220

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	6.98	7.64	7.96

COMMENTS_____

SIGNATURE_____

APPENDIX C.6

SAMPLE LOCATION COORDINATES AND ELEVATIONS

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Table C.6.1
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
400	10,888,060.33	3,594,766.86	1896.82
401	10,887,653.79	3,594,806.87	1909.60
637	10,888,102.52	3,594,717.78	1896.48
638	10,888,096.43	3,594,734.29	1896.39
639	10,888,098.79	3,594,752.02	1896.25
640	10,888,062.92	3,594,733.37	1899.04
641	10,888,015.79	3,594,713.75	1901.81
642	10,887,967.79	3,594,701.00	1903.75
643	10,887,918.70	3,594,694.44	1905.29
644	10,887,867.65	3,594,690.65	1906.40
645	10,887,815.58	3,594,697.61	1907.17
646	10,887,767.95	3,594,713.63	1907.62
647	10,887,725.92	3,594,737.58	1906.99
648	10,887,682.56	3,594,763.92	1907.31
649	10,887,639.84	3,594,790.46	1910.25
650	10,887,617.99	3,594,801.75	1912.73
651	10,887,621.53	3,594,810.08	1912.78
652	10,887,644.21	3,594,798.41	1910.15
653	10,887,689.17	3,594,772.56	1907.28
654	10,887,731.58	3,594,746.68	1906.56
655	10,887,675.37	3,594,781.56	1907.82
656	10,887,666.93	3,594,793.62	1908.29
657	10,887,661.37	3,594,800.53	1908.76
658	10,887,667.01	3,594,806.20	1907.96
659	10,887,676.26	3,594,810.06	1906.83
660	10,887,695.92	3,594,796.42	1905.53
661	10,887,716.27	3,594,776.47	1905.18
662	10,887,733.89	3,594,753.69	1906.02
663	10,887,735.86	3,594,744.70	1906.48
664	10,887,722.58	3,594,759.61	1905.89
665	10,887,698.76	3,594,781.10	1906.31
666	10,887,673.88	3,594,798.13	1907.62
667	10,887,773.44	3,594,722.10	1907.31
668	10,887,818.56	3,594,706.72	1906.70
669	10,887,868.19	3,594,701.52	1906.26
670	10,887,853.43	3,594,710.13	1907.89
671	10,887,850.97	3,594,712.37	1910.29
672	10,887,855.43	3,594,712.38	1910.33
673	10,887,855.66	3,594,707.71	1910.30
674	10,887,851.18	3,594,707.53	1910.54
675	10,887,856.08	3,594,713.06	1906.06
676	10,887,856.04	3,594,707.03	1906.11
677	10,887,850.28	3,594,707.10	1906.10
678	10,887,850.38	3,594,713.09	1906.07
679	10,887,918.37	3,594,704.50	1905.11
680	10,887,966.95	3,594,710.38	1903.44
681	10,887,988.83	3,594,716.76	1902.50
682	10,888,011.05	3,594,729.15	1901.28
683	10,888,012.84	3,594,723.54	1901.44
684	10,888,059.21	3,594,743.26	1898.48
685	10,888,055.91	3,594,751.96	1898.11
686	10,888,098.24	3,594,761.36	1896.04
687	10,888,123.15	3,594,790.61	1895.70
688	10,888,060.70	3,594,757.49	1897.46
689	10,888,062.05	3,594,765.93	1896.82
690	10,888,062.02	3,594,765.94	1896.83
691	10,888,071.61	3,594,783.00	1896.17
692	10,888,081.91	3,594,789.12	1895.95
693	10,888,078.74	3,594,807.11	1895.71
694	10,888,068.32	3,594,829.08	1895.83
695	10,888,051.15	3,594,773.02	1896.51
696	10,888,041.41	3,594,793.37	1896.26

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
697	10,888,029.07	3,594,791.02	1896.03
698	10,888,016.88	3,594,814.71	1896.00
699	10,888,010.12	3,594,848.85	1895.64
700	10,888,001.94	3,594,885.52	1894.67
701	10,888,019.40	3,594,902.65	1894.50
702	10,888,026.73	3,594,891.38	1895.11
703	10,888,042.45	3,594,882.41	1895.13
704	10,888,054.54	3,594,850.60	1895.62
705	10,888,064.39	3,594,825.52	1895.83
706	10,888,065.65	3,594,806.80	1895.80
707	10,888,075.39	3,594,799.56	1895.78
708	10,888,062.75	3,594,790.63	1896.11
709	10,888,042.02	3,594,812.34	1896.16
710	10,888,033.34	3,594,845.27	1895.89
711	10,888,022.38	3,594,885.61	1895.09
712	10,887,914.88	3,594,866.62	1895.92
713	10,887,920.17	3,594,816.90	1897.33
714	10,887,925.71	3,594,767.15	1898.99
715	10,887,931.14	3,594,717.51	1904.70
716	10,887,936.50	3,594,667.85	1913.18
717	10,887,732.39	3,594,695.71	1912.86
718	10,887,782.21	3,594,701.39	1908.93
719	10,887,831.78	3,594,706.59	1906.81
720	10,887,881.50	3,594,712.03	1906.09
721	10,887,980.69	3,594,722.95	1903.33
722	10,888,030.59	3,594,728.32	1900.79
723	10,888,129.97	3,594,739.25	1895.75
724	10,888,053.04	3,594,753.06	1898.00
725	10,888,024.01	3,594,738.66	1900.24
726	10,887,990.87	3,594,729.38	1902.43
727	10,887,949.66	3,594,721.76	1903.79
728	10,887,900.14	3,594,714.59	1905.26
729	10,887,862.95	3,594,714.22	1905.21
730	10,887,846.71	3,594,708.96	1905.17
731	10,887,815.44	3,594,715.09	1905.40
732	10,887,793.24	3,594,720.05	1905.86
733	10,887,778.17	3,594,727.22	1906.12
734	10,887,854.35	3,594,719.86	1904.39
735	10,887,871.47	3,594,725.00	1902.70
736	10,887,923.87	3,594,726.31	1900.52
737	10,887,965.34	3,594,731.44	1900.22
738	10,887,995.91	3,594,741.25	1899.09
739	10,888,035.62	3,594,748.52	1898.41
740	10,888,039.13	3,594,762.51	1897.25
741	10,888,034.43	3,594,782.74	1895.90
742	10,888,024.06	3,594,762.23	1897.74
743	10,888,022.34	3,594,786.23	1895.91
744	10,887,994.35	3,594,910.96	1893.45
745	10,888,031.32	3,594,923.26	1893.55
746	10,888,050.31	3,594,929.65	1894.70
747	10,888,075.70	3,594,939.77	1894.76
748	10,888,104.23	3,594,949.49	1894.39
749	10,888,136.01	3,594,954.35	1893.21
750	10,888,144.37	3,594,970.58	1892.46
751	10,888,108.50	3,594,967.94	1893.25
752	10,888,071.28	3,594,967.86	1893.33
753	10,888,035.00	3,594,960.16	1892.95
754	10,888,004.55	3,594,950.19	1892.44
755	10,887,974.23	3,594,941.33	1892.25
756	10,888,042.61	3,594,904.97	1894.78
757	10,888,056.15	3,594,868.80	1895.74
758	10,888,069.08	3,594,830.01	1895.71

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
759	10,888,112.39	3,594,841.10	1896.38
760	10,888,146.09	3,594,850.60	1895.77
761	10,888,134.38	3,594,884.11	1896.10
762	10,888,120.05	3,594,925.55	1894.78
763	10,888,092.81	3,594,918.68	1895.40
764	10,888,145.44	3,594,964.42	1892.69
765	10,888,149.24	3,594,985.39	1890.92
766	10,888,113.13	3,594,993.66	1891.01
767	10,888,109.92	3,594,975.37	1892.62
768	10,888,074.96	3,594,984.08	1892.24
769	10,888,082.18	3,595,011.48	1888.01
770	10,888,070.15	3,595,010.09	1888.35
771	10,888,045.25	3,594,998.30	1890.65
772	10,888,038.03	3,594,990.74	1890.72
773	10,888,009.80	3,594,992.44	1890.94
774	10,887,986.62	3,594,976.57	1890.95
775	10,887,955.75	3,594,968.31	1889.91
776	10,887,956.77	3,594,961.88	1890.36
777	10,887,944.96	3,594,968.99	1889.28
778	10,887,933.79	3,594,965.60	1889.66
779	10,887,939.27	3,594,957.47	1890.18
780	10,887,931.22	3,594,959.84	1889.50
781	10,887,928.85	3,594,953.83	1889.11
782	10,887,933.93	3,594,947.61	1890.23
783	10,887,928.47	3,594,948.96	1890.13
784	10,887,921.47	3,594,914.50	1892.33
785	10,887,923.82	3,594,907.25	1893.07
786	10,887,920.36	3,594,909.33	1892.75
787	10,887,913.15	3,594,894.05	1894.85
788	10,887,906.82	3,594,886.61	1893.82
789	10,887,903.33	3,594,879.98	1893.91
790	10,887,902.83	3,594,871.75	1893.56
791	10,887,898.96	3,594,874.45	1893.10
792	10,887,884.96	3,594,869.45	1893.55
793	10,887,882.86	3,594,873.25	1893.05
794	10,887,868.95	3,594,875.73	1894.66
795	10,887,857.85	3,594,869.77	1894.96
796	10,887,845.77	3,594,871.48	1895.13
797	10,887,856.26	3,594,874.53	1894.89
798	10,887,824.09	3,594,878.52	1896.97
799	10,887,801.80	3,594,882.09	1897.70
800	10,887,766.13	3,594,884.35	1899.38
801	10,887,740.82	3,594,893.46	1899.20
802	10,887,726.20	3,594,900.35	1899.27
803	10,887,711.25	3,594,902.38	1899.63
804	10,887,707.92	3,594,918.00	1896.84
805	10,887,721.01	3,594,915.87	1896.17
806	10,887,733.35	3,594,911.00	1895.94
807	10,887,744.45	3,594,901.54	1896.41
808	10,887,753.69	3,594,885.34	1899.06
809	10,887,699.25	3,594,909.49	1898.27
810	10,887,667.50	3,594,874.66	1905.13
811	10,887,642.51	3,594,848.62	1909.69
812	10,887,620.51	3,594,830.13	1912.82
813	10,887,604.33	3,594,831.24	1915.86
814	10,887,634.53	3,594,828.86	1912.09
815	10,887,656.97	3,594,851.76	1908.78
816	10,887,686.05	3,594,875.09	1903.71
817	10,887,708.61	3,594,907.06	1898.77
818	10,887,728.81	3,594,925.42	1891.18
819	10,887,740.95	3,594,948.43	1888.34
820	10,887,783.17	3,594,966.76	1883.26

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
821	10,887,995.81	3,594,749.93	1898.10
822	10,887,990.81	3,594,790.72	1896.85
823	10,887,986.95	3,594,832.81	1896.21
824	10,887,982.15	3,594,872.73	1895.24
825	10,887,975.36	3,594,914.32	1893.52
826	10,887,967.29	3,594,945.83	1892.00
827	10,887,936.79	3,594,927.04	1892.06
828	10,887,934.56	3,594,889.68	1894.40
829	10,887,938.78	3,594,848.57	1895.82
830	10,887,946.64	3,594,805.60	1897.11
831	10,887,946.67	3,594,760.11	1898.13
832	10,887,950.50	3,594,745.38	1899.23
833	10,887,919.58	3,594,740.03	1900.07
834	10,887,913.44	3,594,776.89	1898.14
835	10,887,909.25	3,594,815.79	1896.87
836	10,887,909.99	3,594,828.24	1895.39
837	10,887,907.78	3,594,850.66	1894.69
838	10,887,904.27	3,594,873.24	1893.59
839	10,887,905.62	3,594,877.45	1894.45
840	10,887,911.21	3,594,870.41	1895.38
841	10,887,911.04	3,594,852.26	1895.93
842	10,887,912.30	3,594,842.64	1895.72
843	10,887,919.89	3,594,825.59	1896.47
844	10,887,902.97	3,594,821.31	1896.54
845	10,887,900.02	3,594,837.41	1895.78
846	10,887,905.81	3,594,849.17	1895.14
847	10,887,902.24	3,594,871.84	1893.56
848	10,887,882.83	3,594,851.40	1895.19
849	10,887,885.30	3,594,822.85	1897.37
850	10,887,885.28	3,594,789.11	1898.35
851	10,887,887.54	3,594,746.80	1900.43
852	10,887,847.00	3,594,742.82	1901.66
853	10,887,844.01	3,594,781.29	1899.79
854	10,887,842.00	3,594,818.92	1898.75
855	10,887,840.71	3,594,854.87	1896.32
856	10,887,801.87	3,594,863.86	1896.82
857	10,887,815.63	3,594,824.02	1898.76
858	10,887,827.30	3,594,798.10	1900.49
859	10,887,834.72	3,594,770.69	1900.50
860	10,887,835.90	3,594,739.81	1902.21
861	10,887,793.57	3,594,747.46	1903.71
862	10,887,794.00	3,594,766.22	1902.00
863	10,887,791.81	3,594,796.01	1901.06
864	10,887,791.10	3,594,818.37	1900.44
865	10,887,790.85	3,594,842.98	1897.90
866	10,887,789.91	3,594,862.71	1897.35
867	10,887,754.74	3,594,867.34	1899.22
868	10,887,759.74	3,594,843.90	1898.84
869	10,887,762.81	3,594,810.51	1902.22
870	10,887,755.86	3,594,769.59	1903.75
871	10,887,715.23	3,594,786.94	1904.73
872	10,887,720.97	3,594,827.29	1902.78
873	10,887,723.93	3,594,851.02	1900.96
874	10,887,725.54	3,594,872.59	1900.69
875	10,887,690.82	3,594,854.16	1904.47
876	10,887,686.43	3,594,812.96	1905.87
877	10,887,657.78	3,594,824.29	1908.91
878	10,887,650.07	3,594,810.76	1909.89
879	10,887,640.55	3,594,812.98	1911.76
880	10,887,645.12	3,594,834.07	1910.87
881	10,887,613.58	3,594,832.89	1915.12
882	10,887,642.39	3,594,857.88	1911.23

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
883	10,887,663.15	3,594,878.31	1906.40
884	10,887,687.41	3,594,902.03	1900.45
885	10,887,988.81	3,594,971.14	1891.43
886	10,888,138.48	3,594,994.24	1889.04
887	10,888,110.62	3,595,005.87	1886.36
888	10,888,079.24	3,595,023.62	1882.51
889	10,888,058.13	3,595,016.67	1883.29
890	10,888,047.27	3,595,021.51	1882.31
891	10,888,016.84	3,595,017.24	1882.27
892	10,887,987.51	3,594,997.45	1883.84
893	10,887,967.00	3,594,985.73	1883.89
894	10,887,944.34	3,594,980.96	1883.82
895	10,887,946.32	3,594,980.80	1884.05
896	10,887,945.21	3,594,968.18	1889.38
897	10,887,949.38	3,594,963.80	1890.38
898	10,887,962.13	3,594,957.77	1891.03
899	10,887,982.40	3,594,945.07	1892.08
900	10,887,984.58	3,594,947.85	1892.07
901	10,887,997.68	3,594,937.09	1892.20
902	10,887,982.57	3,594,947.32	1891.63
903	10,887,961.93	3,594,960.41	1890.14
904	10,887,962.02	3,594,962.20	1890.51
905	10,887,955.87	3,594,967.62	1889.87
906	10,887,956.94	3,594,965.18	1889.21
907	10,887,951.96	3,594,967.26	1887.51
908	10,887,949.21	3,594,971.49	1886.23
909	10,887,948.38	3,594,978.84	1884.64
910	10,887,952.76	3,594,970.44	1888.50
911	10,887,952.78	3,594,978.44	1885.34
912	10,887,929.27	3,594,976.47	1883.35
913	10,887,924.99	3,594,970.13	1883.40
914	10,887,925.67	3,594,968.23	1883.80
915	10,887,932.70	3,594,961.67	1887.90
916	10,887,938.89	3,594,957.98	1890.01
917	10,887,933.57	3,594,964.52	1889.55
918	10,887,939.92	3,594,960.44	1890.46
919	10,887,937.18	3,594,956.44	1890.45
920	10,887,930.68	3,594,960.17	1889.36
921	10,887,922.69	3,594,967.44	1883.29
922	10,887,923.55	3,594,952.55	1886.60
923	10,887,928.99	3,594,948.78	1890.31
924	10,887,930.88	3,594,950.33	1888.98
925	10,887,932.45	3,594,951.58	1890.53
926	10,887,907.44	3,594,934.68	1883.92
927	10,887,908.00	3,594,914.73	1885.85
928	10,887,889.75	3,594,884.09	1886.49
929	10,887,895.55	3,594,880.76	1888.40
930	10,887,901.10	3,594,876.45	1891.93
931	10,887,898.96	3,594,873.97	1893.37
932	10,887,903.54	3,594,871.52	1893.60
933	10,887,920.96	3,594,910.88	1891.16
934	10,887,917.00	3,594,912.52	1888.97
935	10,887,916.41	3,594,910.48	1890.55
936	10,887,918.63	3,594,914.48	1890.41
937	10,887,911.70	3,594,914.15	1886.57
938	10,887,887.67	3,594,884.76	1886.10
939	10,887,872.04	3,594,899.46	1884.61
940	10,887,851.24	3,594,894.82	1884.22
941	10,887,804.84	3,594,903.53	1885.15
942	10,887,789.23	3,594,910.01	1885.32
943	10,887,781.27	3,594,902.45	1886.73
944	10,887,762.38	3,594,908.71	1887.35

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
945	10,887,747.14	3,594,922.35	1887.81
946	10,887,717.21	3,594,928.64	1892.88
947	10,887,741.29	3,594,950.56	1888.35
948	10,887,761.88	3,594,944.45	1886.42
949	10,887,771.09	3,594,941.90	1884.77
950	10,887,751.81	3,594,907.30	1890.77
951	10,887,769.88	3,594,900.22	1888.33
952	10,887,780.58	3,594,895.91	1891.81
953	10,887,792.06	3,594,895.98	1889.55
954	10,887,794.12	3,594,900.20	1889.72
955	10,887,820.29	3,594,932.91	1883.16
956	10,887,867.26	3,594,940.39	1883.31
957	10,887,863.85	3,594,883.91	1888.66
958	10,887,858.52	3,594,875.65	1894.12
959	10,887,851.95	3,594,872.83	1895.48
960	10,887,843.62	3,594,871.78	1895.50
961	10,887,844.39	3,594,868.80	1895.66
962	10,887,843.89	3,594,870.99	1895.27
963	10,887,851.99	3,594,870.72	1894.41
964	10,887,852.99	3,594,869.18	1895.67
965	10,887,863.86	3,594,871.13	1894.37
966	10,887,869.48	3,594,876.75	1894.06
967	10,887,860.93	3,594,874.86	1890.83
968	10,887,867.26	3,594,885.56	1888.05
969	10,887,869.77	3,594,883.75	1888.78
970	10,887,889.03	3,594,918.84	1883.61
971	10,887,907.60	3,594,916.36	1885.22
972	10,887,865.50	3,594,935.50	1883.34
973	10,887,898.33	3,594,990.70	1882.12
974	10,887,916.40	3,594,974.73	1882.45
975	10,887,915.52	3,595,005.52	1880.66
976	10,887,920.47	3,595,005.85	1880.51
977	10,887,926.53	3,594,978.30	1882.70
978	10,887,923.79	3,594,977.85	1881.99
979	10,887,918.09	3,594,977.04	1881.83
980	10,887,917.14	3,595,002.75	1880.38
981	10,887,920.19	3,595,003.18	1880.45
982	10,887,920.77	3,595,014.27	1879.97
983	10,887,954.81	3,595,012.88	1880.05
984	10,887,962.29	3,595,010.18	1881.10
985	10,887,967.81	3,595,011.56	1881.11
986	10,887,966.38	3,595,017.41	1880.70
987	10,887,960.88	3,595,015.97	1880.65
988	10,887,962.56	3,595,011.01	1883.89
989	10,887,967.14	3,595,012.26	1883.82
990	10,887,965.93	3,595,016.77	1883.46
991	10,887,961.57	3,595,015.84	1883.37
992	10,887,964.45	3,595,013.83	1882.35
993	10,887,993.30	3,595,028.57	1879.66
994	10,888,031.24	3,595,040.51	1880.00
995	10,888,076.02	3,595,037.71	1880.58
996	10,888,115.67	3,595,028.55	1883.24
997	10,888,153.64	3,595,004.53	1887.30
998	10,888,182.45	3,595,003.08	1889.23
999	10,887,914.16	3,594,846.65	1896.06
1000	10,887,919.55	3,594,801.95	1897.61
1001	10,887,921.68	3,594,783.14	1897.84
1002	10,887,927.18	3,594,737.36	1899.84
1003	10,887,922.12	3,594,729.60	1900.28
1004	10,887,933.14	3,594,686.90	1908.28
1005	10,887,923.53	3,594,685.36	1908.92
1006	10,887,911.13	3,594,684.53	1908.84

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
2000	10,887,678.03	3,594,795.04	0.00
2001	10,887,686.98	3,594,790.83	0.00
2002	10,887,699.32	3,594,776.27	0.00
2003	10,887,716.29	3,594,763.78	0.00
2004	10,887,767.20	3,594,743.79	0.00
2005	10,887,769.67	3,594,797.41	0.00
2006	10,887,850.68	3,594,838.58	0.00
2007	10,887,711.53	3,594,872.92	0.00
2008	10,887,895.21	3,594,808.88	0.00
2009	10,887,962.53	3,594,837.51	0.00
2010	10,887,867.82	3,594,889.03	0.00
2011	10,887,922.19	3,594,974.77	0.00
2012	10,887,948.17	3,594,986.77	0.00
2013	10,888,003.21	3,594,941.42	0.00
2014	10,888,092.65	3,594,881.14	0.00
2015	10,888,026.08	3,594,867.60	0.00
2016	10,888,037.53	3,594,837.51	0.00
2017	10,888,047.64	3,594,802.98	0.00
2018	10,887,987.53	3,594,787.51	0.00
2019	10,887,937.53	3,594,762.51	0.00
2020	10,888,037.53	3,594,762.51	0.00
2021	10,887,862.53	3,594,737.51	0.00
2022	10,887,789.64	3,594,850.79	0.00
2077	10,888,102.52	3,594,717.78	1896.48
2078	10,888,096.43	3,594,734.29	1896.39
2079	10,888,098.79	3,594,752.02	1896.25
2080	10,888,062.92	3,594,733.37	1899.04
2081	10,888,015.79	3,594,713.75	1901.81
2082	10,887,967.79	3,594,701.00	1903.75
2083	10,887,918.70	3,594,694.44	1905.29
2084	10,887,867.65	3,594,690.65	1906.40
2085	10,887,815.58	3,594,697.61	1907.17
2086	10,887,767.95	3,594,713.63	1907.62
2087	10,887,725.92	3,594,737.58	1906.99
2088	10,887,682.56	3,594,763.92	1907.31
2089	10,887,639.84	3,594,790.46	1910.25
2090	10,887,617.99	3,594,801.75	1912.73
2091	10,887,621.53	3,594,810.08	1912.78
2092	10,887,644.21	3,594,798.41	1910.15
2093	10,887,689.17	3,594,772.56	1907.28
2094	10,887,731.58	3,594,746.68	1906.56
2095	10,887,675.37	3,594,781.56	1907.82
2096	10,887,666.93	3,594,793.62	1908.29
2097	10,887,661.37	3,594,800.53	1908.76
2098	10,887,667.01	3,594,806.20	1907.96
2099	10,887,676.26	3,594,810.06	1906.83
2100	10,887,695.92	3,594,796.42	1905.53
2101	10,887,716.27	3,594,776.47	1905.18
2102	10,887,733.89	3,594,753.69	1906.02
2103	10,887,735.86	3,594,744.70	1906.48
2104	10,887,722.58	3,594,759.61	1905.89
2105	10,887,698.76	3,594,781.10	1906.31
2106	10,887,673.88	3,594,798.13	1907.62
2107	10,887,773.44	3,594,722.10	1907.31
2108	10,887,818.56	3,594,706.72	1906.70
2109	10,887,868.19	3,594,701.52	1906.26
2110	10,887,853.43	3,594,710.13	1907.89
2111	10,887,850.97	3,594,712.37	1910.29
2112	10,887,855.43	3,594,712.38	1910.33
2113	10,887,855.66	3,594,707.71	1910.30
2114	10,887,851.18	3,594,707.53	1910.54
2115	10,887,856.08	3,594,713.06	1906.06

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
2116	10,887,856.04	3,594,707.03	1906.11
2117	10,887,850.28	3,594,707.10	1906.10
2118	10,887,850.38	3,594,713.09	1906.07
2119	10,887,918.37	3,594,704.50	1905.11
2120	10,887,966.95	3,594,710.38	1903.44
2121	10,887,988.83	3,594,716.76	1902.50
2122	10,888,011.05	3,594,729.15	1901.28
2123	10,888,012.84	3,594,723.54	1901.44
2124	10,888,059.21	3,594,743.26	1898.48
2125	10,888,055.91	3,594,751.96	1898.11
2126	10,888,098.24	3,594,761.36	1896.04
2127	10,888,123.15	3,594,790.61	1895.70
2128	10,888,060.70	3,594,757.49	1897.46
2129	10,888,062.05	3,594,765.93	1896.82
2130	10,888,062.02	3,594,765.94	1896.83
2131	10,888,071.61	3,594,783.00	1896.17
2132	10,888,081.91	3,594,789.12	1895.95
2133	10,888,078.74	3,594,807.11	1895.71
2134	10,888,068.32	3,594,829.08	1895.83
2135	10,888,051.15	3,594,773.02	1896.51
2136	10,888,041.41	3,594,793.37	1896.26
2137	10,888,029.07	3,594,791.02	1896.03
2138	10,888,016.88	3,594,814.71	1896.00
2139	10,888,010.12	3,594,848.85	1895.64
2140	10,888,001.94	3,594,885.52	1894.67
2141	10,888,019.40	3,594,902.65	1894.50
2142	10,888,026.73	3,594,891.38	1895.11
2143	10,888,042.45	3,594,882.41	1895.13
2144	10,888,054.54	3,594,850.60	1895.62
2145	10,888,064.39	3,594,825.52	1895.83
2146	10,888,065.65	3,594,806.80	1895.80
2147	10,888,075.39	3,594,799.56	1895.78
2148	10,888,062.75	3,594,790.63	1896.11
2149	10,888,042.02	3,594,812.34	1896.16
2150	10,888,033.34	3,594,845.27	1895.89
2151	10,888,022.38	3,594,885.61	1895.09
2152	10,887,914.88	3,594,866.62	1895.92
2153	10,887,920.17	3,594,816.90	1897.33
2154	10,887,925.71	3,594,767.15	1898.99
2155	10,887,931.14	3,594,717.51	1904.70
2156	10,887,936.50	3,594,667.85	1913.18
2157	10,887,732.39	3,594,695.71	1912.86
2158	10,887,782.21	3,594,701.39	1908.93
2159	10,887,831.78	3,594,706.59	1906.81
2160	10,887,881.50	3,594,712.03	1906.09
2161	10,887,980.69	3,594,722.95	1903.33
2162	10,888,030.59	3,594,728.32	1900.79
2163	10,888,129.97	3,594,739.25	1895.75
2164	10,888,053.04	3,594,753.06	1898.00
2165	10,888,024.01	3,594,738.66	1900.24
2166	10,887,990.87	3,594,729.38	1902.43
2167	10,887,949.66	3,594,721.76	1903.79
2168	10,887,900.14	3,594,714.59	1905.26
2169	10,887,862.95	3,594,714.22	1905.21
2170	10,887,846.71	3,594,708.96	1905.17
2171	10,887,815.44	3,594,715.09	1905.40
2172	10,887,793.24	3,594,720.05	1905.86
2173	10,887,778.17	3,594,727.22	1906.12
2174	10,887,854.35	3,594,719.86	1904.39
2175	10,887,871.47	3,594,725.00	1902.70
2176	10,887,923.87	3,594,726.31	1900.52
2177	10,887,965.34	3,594,731.44	1900.22

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
2178	10,887,995.91	3,594,741.25	1899.09
2179	10,888,035.62	3,594,748.52	1898.41
2180	10,888,039.13	3,594,762.51	1897.25
2181	10,888,034.43	3,594,782.74	1895.90
2182	10,888,024.06	3,594,762.23	1897.74
2183	10,888,022.34	3,594,786.23	1895.91
2184	10,887,994.35	3,594,910.96	1893.45
2185	10,888,031.32	3,594,923.26	1893.55
2186	10,888,050.31	3,594,929.65	1894.70
2187	10,888,075.70	3,594,939.77	1894.76
2188	10,888,104.23	3,594,949.49	1894.39
2189	10,888,136.01	3,594,954.35	1893.21
2190	10,888,144.37	3,594,970.58	1892.46
2191	10,888,108.50	3,594,967.94	1893.25
2192	10,888,071.28	3,594,967.86	1893.33
2193	10,888,035.00	3,594,960.16	1892.95
2194	10,888,004.55	3,594,950.19	1892.44
2195	10,887,974.23	3,594,941.33	1892.25
2196	10,888,042.61	3,594,904.97	1894.78
2197	10,888,056.15	3,594,868.80	1895.74
2198	10,888,069.08	3,594,830.01	1895.71
2199	10,888,112.39	3,594,841.10	1896.38
2200	10,888,146.09	3,594,850.60	1895.77
2201	10,888,134.38	3,594,884.11	1896.10
2202	10,888,120.05	3,594,925.55	1894.78
2203	10,888,092.81	3,594,918.68	1895.40
2204	10,888,145.44	3,594,964.42	1892.69
2205	10,888,149.24	3,594,985.39	1890.92
2206	10,888,113.13	3,594,993.66	1891.01
2207	10,888,109.92	3,594,975.37	1892.62
2208	10,888,074.96	3,594,984.08	1892.24
2209	10,888,082.18	3,595,011.48	1888.01
2210	10,888,070.15	3,595,010.09	1888.35
2211	10,888,045.25	3,594,998.30	1890.65
2212	10,888,038.03	3,594,990.74	1890.72
2213	10,888,009.80	3,594,992.44	1890.94
2214	10,887,986.62	3,594,976.57	1890.95
2215	10,887,955.75	3,594,968.31	1889.91
2216	10,887,956.77	3,594,961.88	1890.36
2217	10,887,944.96	3,594,968.99	1889.28
2218	10,887,933.79	3,594,965.60	1889.66
2219	10,887,939.27	3,594,957.47	1890.18
2220	10,887,931.22	3,594,959.84	1889.50
2221	10,887,928.85	3,594,953.83	1889.11
2222	10,887,933.93	3,594,947.61	1890.23
2223	10,887,928.47	3,594,948.96	1890.13
2224	10,887,921.47	3,594,914.50	1892.33
2225	10,887,923.82	3,594,907.25	1893.07
2226	10,887,920.36	3,594,909.33	1892.75
2227	10,887,913.15	3,594,894.05	1894.85
2228	10,887,906.82	3,594,886.61	1893.82
2229	10,887,903.33	3,594,879.98	1893.91
2230	10,887,902.83	3,594,871.75	1893.56
2231	10,887,898.96	3,594,874.45	1893.10
2232	10,887,884.96	3,594,869.45	1893.55
2233	10,887,882.86	3,594,873.25	1893.05
2234	10,887,868.95	3,594,875.73	1894.66
2235	10,887,857.85	3,594,869.77	1894.96
2236	10,887,845.77	3,594,871.48	1895.13
2237	10,887,856.26	3,594,874.53	1894.89
2238	10,887,824.09	3,594,878.52	1896.97
2239	10,887,801.80	3,594,882.09	1897.70

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
2240	10,887,766.13	3,594,884.35	1899.38
2241	10,887,740.82	3,594,893.46	1899.20
2242	10,887,726.20	3,594,900.35	1899.27
2243	10,887,711.25	3,594,902.38	1899.63
2244	10,887,707.92	3,594,918.00	1896.84
2245	10,887,721.01	3,594,915.87	1896.17
2246	10,887,733.35	3,594,911.00	1895.94
2247	10,887,744.45	3,594,901.54	1896.41
2248	10,887,753.69	3,594,885.34	1899.06
2249	10,887,699.25	3,594,909.49	1898.27
2250	10,887,667.50	3,594,874.66	1905.13
2251	10,887,642.51	3,594,848.62	1909.69
2252	10,887,620.51	3,594,830.13	1912.82
2253	10,887,604.33	3,594,831.24	1915.86
2254	10,887,634.53	3,594,828.86	1912.09
2255	10,887,656.97	3,594,851.76	1908.78
2256	10,887,686.05	3,594,875.09	1903.71
2257	10,887,708.61	3,594,907.06	1898.77
2258	10,887,728.81	3,594,925.42	1891.18
2259	10,887,740.95	3,594,948.43	1888.34
2260	10,887,783.17	3,594,966.76	1883.26
2261	10,887,995.81	3,594,749.93	1898.10
2262	10,887,990.81	3,594,790.72	1896.85
2263	10,887,986.95	3,594,832.81	1896.21
2264	10,887,982.15	3,594,872.73	1895.24
2265	10,887,975.36	3,594,914.32	1893.52
2266	10,887,967.29	3,594,945.83	1892.00
2267	10,887,936.79	3,594,927.04	1892.06
2268	10,887,934.56	3,594,889.68	1894.40
2269	10,887,938.78	3,594,848.57	1895.82
2270	10,887,946.64	3,594,805.60	1897.11
2271	10,887,946.67	3,594,760.11	1898.13
2272	10,887,950.50	3,594,745.38	1899.23
2273	10,887,919.58	3,594,740.03	1900.07
2274	10,887,913.44	3,594,776.89	1898.14
2275	10,887,909.25	3,594,815.79	1896.87
2276	10,887,909.99	3,594,828.24	1895.39
2277	10,887,907.78	3,594,850.66	1894.69
2278	10,887,904.27	3,594,873.24	1893.59
2279	10,887,905.62	3,594,877.45	1894.45
2280	10,887,911.21	3,594,870.41	1895.38
2281	10,887,911.04	3,594,852.26	1895.93
2282	10,887,912.30	3,594,842.64	1895.72
2283	10,887,919.89	3,594,825.59	1896.47
2284	10,887,902.97	3,594,821.31	1896.54
2285	10,887,900.02	3,594,837.41	1895.78
2286	10,887,905.81	3,594,849.17	1895.14
2287	10,887,902.24	3,594,871.84	1893.56
2288	10,887,882.83	3,594,851.40	1895.19
2289	10,887,885.30	3,594,822.85	1897.37
2290	10,887,885.28	3,594,789.11	1898.35
2291	10,887,887.54	3,594,746.80	1900.43
2292	10,887,847.00	3,594,742.82	1901.66
2293	10,887,844.01	3,594,781.29	1899.79
2294	10,887,842.00	3,594,818.92	1898.75
2295	10,887,840.71	3,594,854.87	1896.32
2296	10,887,801.87	3,594,863.86	1896.82
2297	10,887,815.63	3,594,824.02	1898.76
2298	10,887,827.30	3,594,798.10	1900.49
2299	10,887,834.72	3,594,770.69	1900.50
2300	10,887,835.90	3,594,739.81	1902.21
2301	10,887,793.57	3,594,747.46	1903.71

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
2302	10,887,794.00	3,594,766.22	1902.00
2303	10,887,791.81	3,594,796.01	1901.06
2304	10,887,791.10	3,594,818.37	1900.44
2305	10,887,790.85	3,594,842.98	1897.90
2306	10,887,789.91	3,594,862.71	1897.35
2307	10,887,754.74	3,594,867.34	1899.22
2308	10,887,759.74	3,594,843.90	1898.84
2309	10,887,762.81	3,594,810.51	1902.22
2310	10,887,755.86	3,594,769.59	1903.75
2311	10,887,715.23	3,594,786.94	1904.73
2312	10,887,720.97	3,594,827.29	1902.78
2313	10,887,723.93	3,594,851.02	1900.96
2314	10,887,725.54	3,594,872.59	1900.69
2315	10,887,690.82	3,594,854.16	1904.47
2316	10,887,686.43	3,594,812.96	1905.87
2317	10,887,657.78	3,594,824.29	1908.91
2318	10,887,650.07	3,594,810.76	1909.89
2319	10,887,640.55	3,594,812.98	1911.76
2320	10,887,645.12	3,594,834.07	1910.87
2321	10,887,613.58	3,594,832.89	1915.12
2322	10,887,642.39	3,594,857.88	1911.23
2323	10,887,663.15	3,594,878.31	1906.40
2324	10,887,687.41	3,594,902.03	1900.45
2325	10,888,138.48	3,594,994.24	1889.04
2326	10,888,110.62	3,595,005.87	1886.36
2327	10,888,079.24	3,595,023.62	1882.51
2328	10,888,058.13	3,595,016.67	1883.29
2329	10,888,047.27	3,595,021.51	1882.31
2330	10,888,016.84	3,595,017.24	1882.27
2331	10,887,987.51	3,594,997.45	1883.84
2332	10,887,967.00	3,594,985.73	1883.89
2333	10,887,944.34	3,594,980.96	1883.82
2334	10,887,946.32	3,594,980.80	1884.05
2335	10,887,945.21	3,594,968.18	1889.38
2336	10,887,949.38	3,594,963.80	1890.38
2337	10,887,962.13	3,594,957.77	1891.03
2338	10,887,982.40	3,594,945.07	1892.08
2339	10,887,984.58	3,594,947.85	1892.07
2340	10,887,997.68	3,594,937.09	1892.20
2341	10,887,982.57	3,594,947.32	1891.63
2342	10,887,961.93	3,594,960.41	1890.14
2343	10,887,962.02	3,594,962.20	1890.51
2344	10,887,955.87	3,594,967.62	1889.87
2345	10,887,956.94	3,594,965.18	1889.21
2346	10,887,951.96	3,594,967.26	1887.51
2347	10,887,949.21	3,594,971.49	1886.23
2348	10,887,948.38	3,594,978.84	1884.64
2349	10,887,952.76	3,594,970.44	1888.50
2350	10,887,952.78	3,594,978.44	1885.34
2351	10,887,929.27	3,594,976.47	1883.35
2352	10,887,924.99	3,594,970.13	1883.40
2353	10,887,925.67	3,594,968.23	1883.80
2354	10,887,932.70	3,594,961.67	1887.90
2355	10,887,938.89	3,594,957.98	1890.01
2356	10,887,933.57	3,594,964.52	1889.55
2357	10,887,939.92	3,594,960.44	1890.46
2358	10,887,937.18	3,594,956.44	1890.45
2359	10,887,930.68	3,594,960.17	1889.36
2360	10,887,922.69	3,594,967.44	1883.29
2361	10,887,923.55	3,594,952.55	1886.60
2362	10,887,928.99	3,594,948.78	1890.31
2363	10,887,930.88	3,594,950.33	1888.98

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
2364	10,887,932.45	3,594,951.58	1890.53
2365	10,887,907.44	3,594,934.68	1883.92
2366	10,887,908.00	3,594,914.73	1885.85
2367	10,887,889.75	3,594,884.09	1886.49
2368	10,887,895.55	3,594,880.76	1888.40
2369	10,887,901.10	3,594,876.45	1891.93
2370	10,887,898.96	3,594,873.97	1893.37
2371	10,887,903.54	3,594,871.52	1893.60
2372	10,887,920.96	3,594,910.88	1891.16
2373	10,887,917.00	3,594,912.52	1888.97
2374	10,887,916.41	3,594,910.48	1890.55
2375	10,887,918.63	3,594,914.48	1890.41
2376	10,887,911.70	3,594,914.15	1886.57
2377	10,887,887.67	3,594,884.76	1886.10
2378	10,887,872.04	3,594,899.46	1884.61
2379	10,887,851.24	3,594,894.82	1884.22
2380	10,887,804.84	3,594,903.53	1885.15
2381	10,887,789.23	3,594,910.01	1885.32
2382	10,887,781.27	3,594,902.45	1886.73
2383	10,887,762.38	3,594,908.71	1887.35
2384	10,887,747.14	3,594,922.35	1887.81
2385	10,887,717.21	3,594,928.64	1892.88
2386	10,887,741.29	3,594,950.56	1888.35
2387	10,887,761.88	3,594,944.45	1886.42
2388	10,887,771.09	3,594,941.90	1884.77
2389	10,887,751.81	3,594,907.30	1890.77
2390	10,887,769.88	3,594,900.22	1888.33
2391	10,887,780.58	3,594,895.91	1891.81
2392	10,887,792.06	3,594,895.98	1889.55
2393	10,887,794.12	3,594,900.20	1889.72
2394	10,887,820.29	3,594,932.91	1883.16
2395	10,887,867.26	3,594,940.39	1883.31
2396	10,887,863.85	3,594,883.91	1888.66
2397	10,887,858.52	3,594,875.65	1894.12
2398	10,887,851.95	3,594,872.83	1895.48
2399	10,887,843.62	3,594,871.78	1895.50
2400	10,887,844.39	3,594,868.80	1895.66
2401	10,887,843.89	3,594,870.99	1895.27
2402	10,887,851.99	3,594,870.72	1894.41
2403	10,887,852.99	3,594,869.18	1895.67
2404	10,887,863.86	3,594,871.13	1894.37
2405	10,887,869.48	3,594,876.75	1894.06
2406	10,887,860.93	3,594,874.86	1890.83
2407	10,887,867.26	3,594,885.56	1888.05
2408	10,887,869.77	3,594,883.75	1888.78
2409	10,887,889.03	3,594,918.84	1883.61
2410	10,887,907.60	3,594,916.36	1885.22
2411	10,887,865.50	3,594,935.50	1883.34
2412	10,887,898.33	3,594,990.70	1882.12
2413	10,887,916.40	3,594,974.73	1882.45
2414	10,887,915.52	3,595,005.52	1880.66
2415	10,887,920.47	3,595,005.85	1880.51
2416	10,887,926.53	3,594,978.30	1882.70
2417	10,887,923.79	3,594,977.85	1881.99
2418	10,887,918.09	3,594,977.04	1881.83
2419	10,887,917.14	3,595,002.75	1880.38
2420	10,887,920.19	3,595,003.18	1880.45
2421	10,887,920.77	3,595,014.27	1879.97
2422	10,887,954.81	3,595,012.88	1880.05
2423	10,887,962.29	3,595,010.18	1881.10
2424	10,887,967.81	3,595,011.56	1881.11
2425	10,887,966.38	3,595,017.41	1880.70

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
2426	10,887,960.88	3,595,015.97	1880.65
2427	10,887,962.56	3,595,011.01	1883.89
2428	10,887,967.14	3,595,012.26	1883.82
2429	10,887,965.93	3,595,016.77	1883.46
2430	10,887,961.57	3,595,015.84	1883.37
2431	10,887,964.45	3,595,013.83	1882.35
2432	10,887,993.30	3,595,028.57	1879.66
2433	10,888,031.24	3,595,040.51	1880.00
2434	10,888,076.02	3,595,037.71	1880.58
2435	10,888,115.67	3,595,028.55	1883.24
2436	10,888,153.64	3,595,004.53	1887.30
2437	10,888,182.45	3,595,003.08	1889.23
2438	10,887,914.16	3,594,846.65	1896.06
2439	10,887,919.55	3,594,801.95	1897.61
2440	10,887,921.68	3,594,783.14	1897.84
2441	10,887,927.18	3,594,737.36	1899.84
2442	10,887,922.12	3,594,729.60	1900.28
2443	10,887,933.14	3,594,686.90	1908.28
2444	10,887,923.53	3,594,685.36	1908.92
2445	10,887,911.13	3,594,684.53	1908.84
2446	10,887,942.09	3,594,618.09	0.00
2447	10,887,936.65	3,594,667.79	0.00
2448	10,887,931.20	3,594,717.49	0.00
2449	10,887,925.75	3,594,767.20	0.00
2450	10,887,920.31	3,594,816.90	0.00
2451	10,887,914.86	3,594,866.60	0.00
2452	10,887,909.42	3,594,916.30	0.00
2453	10,887,903.97	3,594,966.01	0.00
2454	10,887,898.53	3,595,015.71	0.00
2455	10,887,893.08	3,595,065.41	0.00
2456	10,887,887.63	3,595,115.11	0.00
2457	10,887,991.79	3,594,623.53	0.00
2458	10,888,041.50	3,594,628.98	0.00
2459	10,888,091.20	3,594,634.43	0.00
2460	10,888,140.90	3,594,639.87	0.00
2461	10,888,190.60	3,594,645.32	0.00
2462	10,888,240.31	3,594,650.76	0.00
2463	10,888,290.01	3,594,656.21	0.00
2464	10,888,339.71	3,594,661.65	0.00
2465	10,887,986.35	3,594,673.24	0.00
2466	10,887,980.90	3,594,722.94	0.00
2467	10,887,975.46	3,594,772.64	0.00
2468	10,887,970.01	3,594,822.34	0.00
2469	10,887,964.57	3,594,872.05	0.00
2470	10,887,959.12	3,594,921.75	0.00
2471	10,887,953.67	3,594,971.45	0.00
2472	10,887,948.23	3,595,021.15	0.00
2473	10,887,942.78	3,595,070.86	0.00
2474	10,887,937.34	3,595,120.56	0.00
2475	10,888,036.05	3,594,678.68	0.00
2476	10,888,030.60	3,594,728.39	0.00
2477	10,888,025.16	3,594,778.09	0.00
2478	10,888,019.71	3,594,827.79	0.00
2479	10,888,014.27	3,594,877.49	0.00
2480	10,888,008.82	3,594,927.20	0.00
2481	10,888,003.38	3,594,976.90	0.00
2482	10,887,997.93	3,595,026.60	0.00
2483	10,887,992.49	3,595,076.30	0.00
2484	10,887,987.04	3,595,126.01	0.00
2485	10,888,085.75	3,594,684.13	0.00
2486	10,888,080.31	3,594,733.83	0.00
2487	10,888,074.86	3,594,783.53	0.00

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
2488	10,888,069.42	3,594,833.24	0.00
2489	10,888,063.97	3,594,882.94	0.00
2490	10,888,058.53	3,594,932.64	0.00
2491	10,888,053.08	3,594,982.34	0.00
2492	10,888,047.63	3,595,032.05	0.00
2493	10,888,042.19	3,595,081.75	0.00
2494	10,888,036.74	3,595,131.45	0.00
2495	10,888,135.46	3,594,689.57	0.00
2496	10,888,130.01	3,594,739.28	0.00
2497	10,888,124.56	3,594,788.98	0.00
2498	10,888,119.12	3,594,838.68	0.00
2499	10,888,113.67	3,594,888.38	0.00
2500	10,888,108.23	3,594,938.09	0.00
2501	10,888,102.78	3,594,987.79	0.00
2502	10,888,097.34	3,595,037.49	0.00
2503	10,888,091.89	3,595,087.19	0.00
2504	10,888,086.45	3,595,136.90	0.00
2505	10,887,892.39	3,594,612.64	0.00
2506	10,887,842.69	3,594,607.20	0.00
2507	10,887,792.98	3,594,601.75	0.00
2508	10,887,743.28	3,594,596.31	0.00
2509	10,887,886.94	3,594,662.35	0.00
2510	10,887,881.50	3,594,712.05	0.00
2511	10,887,876.05	3,594,761.75	0.00
2512	10,887,870.61	3,594,811.45	0.00
2513	10,887,865.16	3,594,861.16	0.00
2514	10,887,859.71	3,594,910.86	0.00
2515	10,887,854.27	3,594,960.56	0.00
2516	10,887,848.82	3,595,010.26	0.00
2517	10,887,843.38	3,595,059.97	0.00
2518	10,887,837.93	3,595,109.67	0.00
2519	10,887,837.24	3,594,656.90	0.00
2520	10,887,831.79	3,594,706.60	0.00
2521	10,887,826.35	3,594,756.31	0.00
2522	10,887,820.90	3,594,806.01	0.00
2523	10,887,815.46	3,594,855.71	0.00
2524	10,887,810.01	3,594,905.41	0.00
2525	10,887,804.57	3,594,955.12	0.00
2526	10,887,799.12	3,595,004.82	0.00
2527	10,887,793.68	3,595,054.52	0.00
2528	10,887,788.23	3,595,104.22	0.00
2529	10,887,787.54	3,594,651.45	0.00
2530	10,887,782.09	3,594,701.16	0.00
2531	10,887,776.65	3,594,750.86	0.00
2532	10,887,771.20	3,594,800.56	0.00
2533	10,887,765.76	3,594,850.26	0.00
2534	10,887,760.31	3,594,899.97	0.00
2535	10,887,754.86	3,594,949.67	0.00
2536	10,887,749.42	3,594,999.37	0.00
2537	10,887,743.97	3,595,049.08	0.00
2538	10,887,738.53	3,595,098.78	0.00
2539	10,887,737.84	3,594,646.01	0.00
2540	10,887,732.39	3,594,695.71	0.00
2541	10,887,726.94	3,594,745.41	0.00
2542	10,887,721.50	3,594,795.12	0.00
2543	10,887,716.05	3,594,844.82	0.00
2544	10,887,710.61	3,594,894.52	0.00
2545	10,887,705.16	3,594,944.22	0.00
2546	10,887,699.72	3,594,993.93	0.00
2547	10,887,694.27	3,595,043.63	0.00
2548	10,887,688.82	3,595,093.33	0.00
2549	10,887,693.58	3,594,590.86	0.00

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
2550	10,887,688.13	3,594,640.56	0.00
2551	10,887,682.69	3,594,690.27	0.00
2552	10,887,677.24	3,594,739.97	0.00
2553	10,887,671.80	3,594,789.67	0.00
2554	10,887,666.35	3,594,839.37	0.00
2555	10,887,660.90	3,594,889.08	0.00
2556	10,887,655.46	3,594,938.78	0.00
2557	10,887,650.01	3,594,988.48	0.00
2558	10,887,644.57	3,595,038.18	0.00
2559	10,887,639.12	3,595,087.89	0.00
2560	10,888,168.82	3,594,844.13	0.00
2561	10,888,163.38	3,594,893.83	0.00
2562	10,888,157.93	3,594,943.53	0.00
2563	10,888,152.48	3,594,993.23	0.00
2564	10,888,147.04	3,595,042.94	0.00
2565	10,888,141.59	3,595,092.64	0.00
2566	10,888,136.15	3,595,142.34	0.00
2567	10,887,622.09	3,594,784.23	0.00
2568	10,887,616.65	3,594,833.93	0.00
2569	10,887,611.20	3,594,883.63	0.00
2570	10,887,605.76	3,594,933.33	0.00
2571	10,887,600.31	3,594,983.04	0.00
2572	10,887,594.87	3,595,032.74	0.00
2573	10,887,589.42	3,595,082.44	0.00
2574	10,887,955.54	3,594,955.28	0.00
4000	10,887,747.51	3,595,210.93	1857.84
4001	10,887,653.69	3,594,806.90	1909.61
5000	10,887,942.09	3,594,618.09	0.00
5001	10,887,936.65	3,594,667.79	0.00
5002	10,887,931.20	3,594,717.49	0.00
5003	10,887,925.75	3,594,767.20	0.00
5004	10,887,920.31	3,594,816.90	0.00
5005	10,887,914.86	3,594,866.60	0.00
5006	10,887,909.42	3,594,916.30	0.00
5007	10,887,903.97	3,594,966.01	0.00
5008	10,887,898.53	3,595,015.71	0.00
5009	10,887,893.08	3,595,065.41	0.00
5010	10,887,887.63	3,595,115.11	0.00
5011	10,887,991.79	3,594,623.53	0.00
5012	10,888,041.50	3,594,628.98	0.00
5013	10,888,091.20	3,594,634.43	0.00
5014	10,888,140.90	3,594,639.87	0.00
5015	10,888,190.60	3,594,645.32	0.00
5016	10,888,240.31	3,594,650.76	0.00
5017	10,888,290.01	3,594,656.21	0.00
5018	10,888,339.71	3,594,661.65	0.00
5019	10,887,986.35	3,594,673.24	0.00
5020	10,887,980.90	3,594,722.94	0.00
5021	10,887,975.46	3,594,772.64	0.00
5022	10,887,970.01	3,594,822.34	0.00
5023	10,887,964.57	3,594,872.05	0.00
5024	10,887,959.12	3,594,921.75	0.00
5025	10,887,953.67	3,594,971.45	0.00
5026	10,887,948.23	3,595,021.15	0.00
5027	10,887,942.78	3,595,070.86	0.00
5028	10,887,937.34	3,595,120.56	0.00
5029	10,888,036.05	3,594,678.68	0.00
5030	10,888,030.60	3,594,728.39	0.00
5031	10,888,025.16	3,594,778.09	0.00
5032	10,888,019.71	3,594,827.79	0.00
5033	10,888,014.27	3,594,877.49	0.00
5034	10,888,008.82	3,594,927.20	0.00

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
5035	10,888,003.38	3,594,976.90	0.00
5036	10,887,997.93	3,595,026.60	0.00
5037	10,887,992.49	3,595,076.30	0.00
5038	10,887,987.04	3,595,126.01	0.00
5039	10,888,085.75	3,594,684.13	0.00
5040	10,888,080.31	3,594,733.83	0.00
5041	10,888,074.86	3,594,783.53	0.00
5042	10,888,069.42	3,594,833.24	0.00
5043	10,888,063.97	3,594,882.94	0.00
5044	10,888,058.53	3,594,932.64	0.00
5045	10,888,053.08	3,594,982.34	0.00
5046	10,888,047.63	3,595,032.05	0.00
5047	10,888,042.19	3,595,081.75	0.00
5048	10,888,036.74	3,595,131.45	0.00
5049	10,888,135.46	3,594,689.57	0.00
5050	10,888,130.01	3,594,739.28	0.00
5051	10,888,124.56	3,594,788.98	0.00
5052	10,888,119.12	3,594,838.68	0.00
5053	10,888,113.67	3,594,888.38	0.00
5054	10,888,108.23	3,594,938.09	0.00
5055	10,888,102.78	3,594,987.79	0.00
5056	10,888,097.34	3,595,037.49	0.00
5057	10,888,091.89	3,595,087.19	0.00
5058	10,888,086.45	3,595,136.90	0.00
5059	10,887,892.39	3,594,612.64	0.00
5060	10,887,842.69	3,594,607.20	0.00
5061	10,887,792.98	3,594,601.75	0.00
5062	10,887,743.28	3,594,596.31	0.00
5063	10,887,886.94	3,594,662.35	0.00
5064	10,887,881.50	3,594,712.05	0.00
5065	10,887,876.05	3,594,761.75	0.00
5066	10,887,870.61	3,594,811.45	0.00
5067	10,887,865.16	3,594,861.16	0.00
5068	10,887,859.71	3,594,910.86	0.00
5069	10,887,854.27	3,594,960.56	0.00
5070	10,887,848.82	3,595,010.26	0.00
5071	10,887,843.38	3,595,059.97	0.00
5072	10,887,837.93	3,595,109.67	0.00
5073	10,887,837.24	3,594,656.90	0.00
5074	10,887,831.79	3,594,706.60	0.00
5075	10,887,826.35	3,594,756.31	0.00
5076	10,887,820.90	3,594,806.01	0.00
5077	10,887,815.46	3,594,855.71	0.00
5078	10,887,810.01	3,594,905.41	0.00
5079	10,887,804.57	3,594,955.12	0.00
5080	10,887,799.12	3,595,004.82	0.00
5081	10,887,793.68	3,595,054.52	0.00
5082	10,887,788.23	3,595,104.22	0.00
5083	10,887,787.54	3,594,651.45	0.00
5084	10,887,782.09	3,594,701.16	0.00
5085	10,887,776.65	3,594,750.86	0.00
5086	10,887,771.20	3,594,800.56	0.00
5087	10,887,765.76	3,594,850.26	0.00
5088	10,887,760.31	3,594,899.97	0.00
5089	10,887,754.86	3,594,949.67	0.00
5090	10,887,749.42	3,594,999.37	0.00
5091	10,887,743.97	3,595,049.08	0.00
5092	10,887,738.53	3,595,098.78	0.00
5093	10,887,737.84	3,594,646.01	0.00
5094	10,887,732.39	3,594,695.71	0.00
5095	10,887,726.94	3,594,745.41	0.00
5096	10,887,721.50	3,594,795.12	0.00

Table C.6.1 (Continued)
Base Topographic Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point Designation	Easting	Northing	Elevation (feet MSL)
5097	10,887,716.05	3,594,844.82	0.00
5098	10,887,710.61	3,594,894.52	0.00
5099	10,887,705.16	3,594,944.22	0.00
5100	10,887,699.72	3,594,993.93	0.00
5101	10,887,694.27	3,595,043.63	0.00
5102	10,887,688.82	3,595,093.33	0.00
5103	10,887,693.58	3,594,590.86	0.00
5104	10,887,688.13	3,594,640.56	0.00
5105	10,887,682.69	3,594,690.27	0.00
5106	10,887,677.24	3,594,739.97	0.00
5107	10,887,671.80	3,594,789.67	0.00
5108	10,887,666.35	3,594,839.37	0.00
5109	10,887,660.90	3,594,889.08	0.00
5110	10,887,655.46	3,594,938.78	0.00
5111	10,887,650.01	3,594,988.48	0.00
5112	10,887,644.57	3,595,038.18	0.00
5114	10,888,168.82	3,594,844.13	0.00
5115	10,888,163.38	3,594,893.83	0.00
5116	10,888,157.93	3,594,943.53	0.00
5117	10,888,152.48	3,594,993.23	0.00
5118	10,888,147.04	3,595,042.94	0.00
5119	10,888,141.59	3,595,092.64	0.00
5120	10,888,136.15	3,595,142.34	0.00
5121	10,887,622.09	3,594,784.23	0.00
5122	10,887,616.65	3,594,833.93	0.00
5123	10,887,611.20	3,594,883.63	0.00
5124	10,887,605.76	3,594,933.33	0.00
5125	10,887,600.31	3,594,983.04	0.00
5126	10,887,594.87	3,595,032.74	0.00
5127	10,887,589.42	3,595,082.44	0.00
5128	10,887,955.54	3,594,955.28	0.00

Notes:

The coordinates are in a raised project coordinate system which has been adjusted by a combined scale and elevation factor of 1.00013. Division of coordinate values by that factor will yield Virginia state plane coordinates, NAD 83 values. The U.S. survey foot was used in the conversion from metric to English units.

MSL = Mean Sea Level

Table C.6.2
Proposed RFI Sample Location Survey Data
(Survey Coordinates from Anderson & Associates)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point	Easting	Northing	Elevation (feet MSL)
40SB1	10887711.49	3594872.91	1901.87
40SB2	10887769.64	3594797.40	1902.11
40SB3	10887767.17	3594743.78	1905.26
40SB4	10887850.65	3594838.57	1896.56
40SB5	10887862.50	3594737.50	1901.77
40SB6	10887895.18	3594808.87	1897.88
40SB7	10887937.50	3594762.50	1898.35
40SB8	10887962.50	3594837.50	1896.20
40SB9	10887987.50	3594787.50	1897.02
40SB10	10888003.18	3594941.41	1892.71
40SB11	10888037.50	3594837.50	1895.90
40SB12	10888037.50	3594762.50	1897.20
40SB13	10888092.62	3594881.13	1895.50
40SS1	10887867.79	3594889.02	1886.90
40SS2	10887922.15	3594974.76	1882.26
40SS3	10887948.13	3594986.76	1883.28
40SS4	10888026.04	3594867.59	1895.53
40SS5	10888047.61	3594802.97	1896.19
71SB11	10887686.95	3594790.82	1906.63
71SS11	10887678.00	3594795.03	1907.30
71SS12	10887699.29	3594776.26	1906.29
71SS13	10887716.25	3594763.77	1906.08
TESTPIT1	10887789.61	3594850.78	1897.29

Notes:
The coordinates are in a raised project coordinate system which has been adjusted by a combined scale and elevation factor of 1.00013. Division of coordinate values by that factor will yield Virginia state plane coordinates, NAD 83 values. The U.S. survey foot was used in the conversion from metric to English units.
MSL = Mean Sea Level

Table C.6.3
RFI Sample Location GPS Survey Data
(GPS Data Points Taken by URS)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point	Easting	Northing	Elevation (feet MSL)
40 OUTCROP A	10886672.649	3594266.477	1891.587
40 OUTCROP B	10886639.189	3594226.667	1901.347
40 OUTCROP C	10886579.488	3594181.526	1912.366
40 OUTCROP D	10886508.178	3594201.606	1908.846
40 OUTCROP E	10886392.787	3594237.566	1902.494
40 OUTCROP F	10886473.367	3594225.926	1900.685
40ASBST NE C	10886726.279	3594463.519	1883.635
40ASBST NW C	10886648.719	3594441.298	1884.195
40ASBST NW C	10886674.209	3594367.448	1884.926
40ASBST SE C	10886752.939	3594388.548	1887.226
40SB01	10886319.045	3594409.357	1895.392
40SB01OFFST1	10886314.876	3594407.498	1893.302
40SB01OFFST2	10886312.836	3594410.507	1893.242
40SB02	10886374.846	3594335.047	1893.734
40SB02OFFST1	10886370.806	3594336.697	1893.363
40SB03	10886375.817	3594281.416	1898.204
40SB03OFFST1	10886372.707	3594280.906	1896.944
40SB03OFFST2	10886381.557	3594274.977	1897.264
40SB04	10886453.047	3594378.887	1891.574
40SB04	10886451.007	3594376.178	1889.244
40SB04OFFST1	10886449.727	3594376.867	1889.304
40SB05	10886471.307	3594276.027	1895.245
40SB05OFFST1	10886466.007	3594276.146	1894.185
40SB05OFFST2	10886475.498	3594275.036	1894.765
40SB06	10886504.227	3594347.497	1891.005
40SB07	10886544.828	3594299.617	1891.175
40SB08	10886570.688	3594376.948	1889.805
40SB09	10886595.309	3594326.877	1890.615
40SB10	10886609.028	3594481.008	1889.254
40SB11	10886645.459	3594374.047	1896.665
40SB12	10886644.898	3594300.607	1893.666
40SB13	10886704.119	3594412.568	1902.336
40SB13OFFST1	10886700.069	3594410.988	1915.626
40SB13OFFST2	10886693.859	3594424.768	1853.015
40SB14	10886531.608	3594433.518	1889.064
40SB15	10886535.908	3594452.008	1887.814
40SS1	10886474.007	3594424.088	1878.154
40SS2	10886527.458	3594509.659	1872.663
40SS3	10886581.718	3594532.049	1871.354
40SS3 SVY PT	10886554.368	3594522.038	1872.424
40SS4	10886631.309	3594401.988	1886.255
40SS5	10886653.809	3594337.427	1886.516
40TP1 NE CNR	10886399.107	3594402.487	1885.433
40TP1 NW CNR	10886395.667	3594403.197	1888.233
40TP1 SE CNR	10886397.487	3594389.427	1887.603
40TP1 SW CNR	10886394.317	3594391.057	1885.033
40TP2 NE CNR	10886447.077	3594289.337	1890.804
40TP2 NW CNR	10886441.807	3594287.837	1895.764
40TP2 SE CNR	10886441.847	3594264.747	1893.975
40TP2 SW CNR	10886437.717	3594265.906	1890.885
71SB11	10886298.296	3594324.867	1896.143
71SB11OFFST1	10886296.185	3594329.106	1895.533
71SB11OFFST2	10886290.876	3594323.636	1899.693
71SS11	10886282.805	3594329.267	1898.623
71SS12	10886302.966	3594315.147	1908.573
71SS13	10886319.106	3594303.447	1908.653

Notes:
These data points were downloaded from a Trimble GPS
Coordinate System is Virginia State Plane South. Units are in feet.
MSL = Mean Sea Level

Table C.6.4
RFI Additional Sampling Locations
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point	Easting	Northing	Elevation (feet MSL)
40SS6	10886345.53	3594445.69	--
40SS7	10886381.60	3594439.03	--
40SS8	10886417.39	3594430.66	--
40SS9	10886483.61	3594433.70	--
40SS10	10886496.89	3594469.46	--
40SS11	10886567.86	3594535.57	--
40SS12	10886604.07	3594545.31	--
40SS13	10886638.51	3594553.58	--
40SS14	10886352.54	3594466.26	--
40SS15	10886382.96	3594458.69	--
40SS16	10886419.53	3594453.04	--
40SS17	10886453.35	3594446.26	--
40SS18	10886480.22	3594453.14	--
40MW3	10886331.37	3594745.82	--
40MW5	10886383.01	3594458.53	--
40MW6	10886477.57	3594472.68	--
17MW3	10886296.81	3593717.20	--
71SB11	10886271.73	3594323.54	--
71SB12	10886250.87	3594342.55	--
71SB13	10886275.07	3594341.19	--
71SB14	10886300.48	3594320.93	--
71SB15	10886320.27	3594295.84	--
71SB16	10886323.10	3594278.77	--
71SS11B	10886262.65	3594327.78	--
71SS12B	10886289.32	3594303.59	--
71SS13	10886301.05	3594296.50	--

Notes:
Coordinates are in VA State Plane(south) NAD 83 (feet)
MSL = Mean Sea Level

APPENDIX C.7

INVESTIGATION-DERIVED MATERIAL ANALYTICAL RESULTS

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SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

40/71IDMSO

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: Q2797

Matrix (soil/water): SOIL Lab Sample ID: Q2797-4

Date Received: 11/25/02 % Solids: 68.18

Concentration Units (mg/L or mg/kg dry weight): mg/Kg

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Ignitability	>140				12/3/02
Paint Filter	YES				12/3/02
Corrosivity as pH	7.46				11/26/02
Reactive Cyanide	183	U			11/26/02
Reactive Sulfide	367	U			11/26/02

Comments: Corrosivity is reported in pH Units, Ignitability in Degrees F, Paint Filter Yes/No as to contents of frre liquids.

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

40/71TP1IDM1

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: Q2797

Matrix (soil/water): SOIL Lab Sample ID: Q2797-1

Date Received: 11/22/02 % Solids: 56.41

Concentration Units (mg/L or mg/kg dry weight): mg/Kg

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Ignitability	138.0				12/3/02
Corrosivity as pH	7.45				11/26/02
Paint Filter	NO				12/3/02
Reactive Cyanide	222	U			11/26/02
Reactive Sulfide	443	U			11/26/02

Comments: Corrosivity is reported in pH Units, Ignitability in Degrees F, Paint Filter Yes/No as to contents of frre liquids.

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

40/71TP1IDM2

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: Q2797

Matrix (soil/water): SOIL Lab Sample ID: Q2797-2

Date Received: 11/22/02 % Solids: 81.82

Concentration Units (mg/L or mg/kg dry weight): mg/Kg

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Ignitability	>140				12/3/02
Corrosivity as pH	7.43				11/26/02
Paint Filter	NO				12/3/02
Reactive Cyanide	153	U			11/26/02
Reactive Sulfide	306	U			11/26/02

Comments: Corrosivity is reported in pH Units, Ignitability in Degrees F, Paint Filter Yes/No as to contents of frre liquids.

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

40/71TP2IDM1

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: Q2797

Matrix (soil/water): SOIL Lab Sample ID: Q2797-3

Date Received: 11/22/02 % Solids: 77.58

Concentration Units (mg/L or mg/kg dry weight): mg/Kg

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Ignitability	>140				12/3/02
Corrosivity as pH	7.79				11/26/02
Paint Filter	NO				12/3/02
Reactive Cyanide	161	U			11/26/02
Reactive Sulfide	322	U			11/26/02

Comments: Corrosivity is reported in pH Units, Ignitability in Degrees F, Paint Filter Yes/No as to contents of frre liquids.

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4071IDMSO

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-4

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/25/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/29/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 12/04/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	27	BP
93-72-1	silvex	12	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4071TP1IDM1

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-1

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/22/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/29/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 12/04/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	6.9	BJP
93-72-1	silvex	5.0	BJP

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4071TP1IDM2

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-2

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/22/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/29/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 12/04/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	22	BP
93-72-1	silvex	1.2	BJP

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4071TP2IDM1

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-3

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/22/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/29/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 12/04/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	38	BP
93-72-1	silvex	8.3	BJP

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4071IDMSO

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-4

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/25/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/29/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/29/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4071TP1IDM1

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-1

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/22/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/29/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/29/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4071TP1IDM2

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-2

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/22/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/29/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/29/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4071TP2IDM1

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-3

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/22/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/29/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/29/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

4071IDMSO

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-4

Sample wt/vol: 100 (g/mL) ML Lab File ID: Q2797-4B64

Level: (low/med) LOW Date Received: 11/25/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/27/02

Concentrated Extract Volume: 500(uL) Date Analyzed: 12/04/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	50	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

4071TP1IDM1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-1

Sample wt/vol: 100 (g/mL) ML Lab File ID: Q2797-1JA64

Level: (low/med) LOW Date Received: 11/22/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/27/02

Concentrated Extract Volume: 500(uL) Date Analyzed: 12/04/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	50	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

4071TP1IDM2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-2

Sample wt/vol: 100 (g/mL) ML Lab File ID: Q2797-2J2A64

Level: (low/med) LOW Date Received: 11/22/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/27/02

Concentrated Extract Volume: 500(uL) Date Analyzed: 12/04/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	50	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

4071TP2IDM1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-3

Sample wt/vol: 100 (g/mL) ML Lab File ID: Q2797-3JA64

Level: (low/med) LOW Date Received: 11/22/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/27/02

Concentrated Extract Volume: 500(uL) Date Analyzed: 12/04/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	50	U

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40/71IDMSO

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix (soil/water): WATER Lab Sample ID: Q2797-4

Level (low/med): LOW Date Received: 11/25/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.3	B		P
7440-39-3	Barium	477	B		P
7440-43-9	Cadmium	1.7	B		P
7440-47-3	Chromium	7.0	B		P
7439-92-1	Lead	1010	B		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	9.9	B		P
7440-22-4	Silver	2.6	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40/71TP1IDM1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix (soil/water): WATER Lab Sample ID: Q2797-1

Level (low/med): LOW Date Received: 11/22/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	32.6	B		P
7440-39-3	Barium	430	B		P
7440-43-9	Cadmium	21.5	B		P
7440-47-3	Chromium	41.6	B		P
7439-92-1	Lead	7350			P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	12.4	B		P
7440-22-4	Silver	2.1	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40/71TP1IDM2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix (soil/water): WATER Lab Sample ID: Q2797-2

Level (low/med): LOW Date Received: 11/22/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	25.5	B		P
7440-39-3	Barium	555	B		P
7440-43-9	Cadmium	12.4	B		P
7440-47-3	Chromium	36.8	B		P
7439-92-1	Lead	2200	B		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	13.2	B		P
7440-22-4	Silver	2.9	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40/71TP2IDM1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix (soil/water): WATER Lab Sample ID: Q2797-3

Level (low/med): LOW Date Received: 11/22/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.0	U		P
7440-39-3	Barium	427	B		P
7440-43-9	Cadmium	2.1	B		P
7440-47-3	Chromium	10.1	B		P
7439-92-1	Lead	93.6	B		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	19.5	B		P
7440-22-4	Silver	2.9	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

4071IDMSO

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-4

Sample wt/vol: 5 (g/ml) ML Lab File ID: Q2797-4B52

Level: (low/med) LOW Date Received: 11/25/02

% Moisture: not dec. _____ Date Analyzed: 12/10/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	25	U
75-35-4	1,1-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
127-18-4	Tetrachloroethene	25	U
108-90-7	Chlorobenzene	25	U

12/17/02 12:53 FAX 919 379 4070 COMPUCHEM 021

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

4071TP1IDM1

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: Q2797-1A52

Level: (low/med) LOW Date Received: 11/22/02

% Moisture: not dec. _____ Date Analyzed: 12/09/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	25	U
75-35-4	1,1-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
127-18-4	Tetrachloroethene	25	U
108-90-7	Chlorobenzene	25	U

FORM I VOA

12/17/02 12:54 FAX 918 379 4070 COMPUCHEM 022

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

4071TP1IDM2

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-2

Sample wt/vol: 5 (g/ml) ML Lab File ID: Q2797-2A52

Level: (low/med) LOW Date Received: 11/22/02

% Moisture: not dec. _____ Date Analyzed: 12/09/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	25	U
75-35-4	1,1-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
127-18-4	Tetrachloroethene	25	U
108-90-7	Chlorobenzene	25	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

4071TP2IDM1

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2797

Matrix: (soil/water) WATER Lab Sample ID: Q2797-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: Q2797-3A52

Level: (low/med) LOW Date Received: 11/22/02

% Moisture: not dec. _____ Date Analyzed: 12/09/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	25	U
75-35-4	1,1-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
127-18-4	Tetrachloroethene	25	U
108-90-7	Chlorobenzene	25	U

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

40/71IDMWA

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: R2797

Matrix (soil/water): WATER Lab Sample ID: R2797-1

Date Received: 11/25/02 % Solids: 100.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Reactive Sulfide	250	U			11/26/02
Ignitability	>140				12/3/02
Paint Filter	YES				12/3/02
Corrosivity as pH	7.10				11/26/02
Reactive Cyanide	125	U			11/26/02

Comments: Corrosivity reported in pH Units, Ignitability in Degrees F, Paint Filter YES/NO as to contents of free liquids.

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4071IDMWA

Lab Name: COMPUCHEM Contract: 8151

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2797

Matrix: (soil/water) WATER Lab Sample ID: R2797-1

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/25/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/29/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 12/04/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	1.3	JB
93-72-1	silvex	0.31	JBP

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

4071IDMWA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2797

Matrix: (soil/water) WATER Lab Sample ID: R2797-1

Sample wt/vol: 100 (g/mL) ML Lab File ID: R2797-1JA64

Level: (low/med) LOW Date Received: 11/25/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/27/02

Concentrated Extract Volume: 500(uL) Date Analyzed: 12/04/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	50	U

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40/71IDMWA

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2797

Matrix (soil/water): WATER Lab Sample ID: R2797-1

Level (low/med): LOW Date Received: 11/25/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	4.2	B		P
7440-39-3	Barium	88.0	B		P
7440-43-9	Cadmium	0.30	U		P
7440-47-3	Chromium	21.0	B		P
7439-92-1	Lead	30.1	B		P
7439-97-6	Mercury	0.29	B		CV
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	2.5	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

4071IDMWA

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2797

Matrix: (soil/water) WATER Lab Sample ID: R2797-1

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/25/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/29/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/30/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40/71IDMWA

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2797

Matrix: (soil/water) WATER Lab Sample ID: R2797-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2797-1A52

Level: (low/med) LOW Date Received: 11/25/02

% Moisture: not dec. _____ Date Analyzed: 12/12/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	25	U
75-35-4	1,1-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	9	J
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
127-18-4	Tetrachloroethene	25	U
108-90-7	Chlorobenzene	25	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

SWMU 40 IDM-Soil

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-40 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: TCLP Laboratory ID: 0708474-03 File ID: 47403.D

Sampled: 08/23/07 09:40 Prepared: 08/30/07 08:00 Analyzed: 08/30/07 19:56

Solids: Preparation: 5030B MS TCLP Initial/Final: 5 g / 5 mL

QC Batch: 0710180 Sequence: 7090419 Calibration: 7I04004 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (mg/L)	MRL	MDL	Q
71-43-2	Benzene, TCLP	100	0.10	0.10	0.012	U
56-23-5	Carbon Tetrachloride, TCLP	100	0.10	0.10	0.015	U
108-90-7	Chlorobenzene, TCLP	100	0.10	0.10	0.012	U
67-66-3	Chloroform, TCLP	100	0.10	0.10	0.0061	U
107-06-2	1,2-Dichloroethane, TCLP	100	0.10	0.10	0.015	U
75-35-4	1,1-Dichloroethene, TCLP	100	0.10	0.10	0.014	U
78-93-3	2-Butanone (MEK), TCLP	100	0.11	5.0	0.033	J, B
127-18-4	Tetrachloroethene, TCLP	100	0.10	0.10	0.015	U
79-01-6	Trichloroethene, TCLP	100	0.10	0.10	0.017	U
75-01-4	Vinyl Chloride, TCLP	100	0.10	0.10	0.017	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane, TCLP	40.0	40.4	101	79 - 124	
1,2-Dichloroethane-d4, TCLP	40.0	42.2	105	75 - 128	
Toluene-d8, TCLP	40.0	39.9	100	87 - 113	
4-Bromofluorobenzene, TCLP	40.0	39.5	99	70 - 121	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene, TCLP	733190	5.16	742619	5.16	
Chlorobenzene-d5, TCLP	676451	8.09	709551	8.09	
1,4-Dichlorobenzene-d4, TCLP	351315	10.39	395097	10.39	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

SWMU 40 IDM-Soil

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-40 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: TCLP Laboratory ID: 0708474-03 File ID: 708474R3

Sampled: 08/23/07 09:40 Prepared: 08/28/07 07:58 Analyzed: 09/06/07 17:05

Solids: Preparation: 3510C TCLP Liquid-Liqu Initial/Final: 1000 mL / 10 mL

QC Batch: 0709883 Sequence: 7090738 Calibration: 7I07011 Instrument: 138

CAS No.	Analyte	Dilution	CONC. (mg/L)	MRL	MDL	Q
106-46-7	1,4-Dichlorobenzene, TCLP	1	0.0050	0.0050	0.000015	U
121-14-2	2,4-Dinitrotoluene, TCLP	1	0.0050	0.0050	0.00021	U
118-74-1	Hexachlorobenzene, TCLP	1	0.0050	0.0050	0.000012	U
87-68-3	Hexachlorobutadiene, TCLP	1	0.0050	0.0050	0.00012	U
67-72-1	Hexachloroethane, TCLP	1	0.0050	0.0050	0.000038	U
98-95-3	Nitrobenzene, TCLP	1	0.0050	0.0050	0.000026	U
110-86-1	Pyridine, TCLP	1	0.050	0.050	0.00038	U
87-86-5	Pentachlorophenol, TCLP	1	0.0050	0.0050	0.00019	U
88-06-2	2,4,6-Trichlorophenol, TCLP	1	0.0050	0.0050	0.000027	U
95-95-4	2,4,5-Trichlorophenol, TCLP	1	0.0050	0.0050	0.00011	U
95-48-7	2-Methylphenol, TCLP	1	0.0050	0.0050	0.00014	U
108-39-4	3-Methylphenol, TCLP	1	0.0050	0.0050	0.000016	U
106-44-5	4-Methylphenol, TCLP	1	0.0050	0.0050	0.000016	U
58-89-9	gamma-BHC (Lindane), TCLP	1	0.0050	0.0050	0.000057	U
72-20-8	Endrin, TCLP	1	0.0050	0.0050	0.00028	U
72-43-5	Methoxychlor, TCLP	1	0.0050	0.0050	0.000072	U
57-74-9	Technical Chlordane, TCLP	1	0.0050	0.0050	0.00012	U
76-44-8	Heptachlor, TCLP	1	0.0050	0.0050	0.000091	U
1024-57-3	Heptachlor Epoxide, TCLP	1	0.0050	0.0050	0.000076	U
8001-35-2	Toxaphene, TCLP	1	0.50	0.50	0.00029	U

System Monitoring Compound	ADDED (mg/L)	CONC (mg/L)	% REC.	QC Limits	Q
2-Fluorophenol, TCLP	0.200	0.125	63	30 - 120	
Phenol-d6, TCLP	0.200	0.0791	40	20 - 109	
Nitrobenzene-d5, TCLP	0.100	0.0982	98	20 - 140	
2-Fluorobiphenyl, TCLP	0.100	0.0866	87	35 - 130	
2,4,6-Tribromophenol, TCLP	0.201	0.182	91	23 - 120	
o-Terphenyl, TCLP	0.100	0.0873	87	34 - 130	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4, TCLP	1409802	9.3	1547321	9.3	
Naphthalene-d8, TCLP	5480543	12.36	6079256	12.35	
Acenaphthene-d10, TCLP	3694553	17.09	4067937	17.09	
Phenanthrene-d10, TCLP	5220229	20.02	5517723	20.02	
Chrysene-d12, TCLP	4911570	24.03	5446158	24.04	
Perylene-d12, TCLP	6341834	27.57	6701579	27.58	

* Values outside of QC limits

00045

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

SWMU 40 IDM-Soil

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-40 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Soil Laboratory ID: 0708474-04 File ID: data008-0

Sampled: 08/23/07 09:40 Prepared: 08/29/07 16:24 Analyzed: 09/04/07 16:47

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0709947 Sequence: 7090569 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.048	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.065	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.066	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.22	89	57 - 139	

* Values outside of QC limits

00085

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

SWMU 40 IDM-Soil

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-40 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Soil Laboratory ID: 0708474-04 File ID: ata008-0

Sampled: 08/23/07 09:40 Prepared: 08/29/07 16:19 Analyzed: 08/30/07 19:52

Solids: Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0709946 Sequence: 7090625 Calibration: 7H28022 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	1.36	55	50 - 150	

* Values outside of QC limits

00107

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

SWMU 40 IDM-Soil

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: TCLP
Sampled: 08/23/07 09:40
Solids: 0.00
Laboratory ID: 0708474-03

SDG: 36440-40
Project: RFAAP SWMU 40
Preparation: 3010A TCLP Digestion
Prepared: 08/29/07 07:15
Initial/Final: 25 mL / 25 mL
QC Batch: 0709907

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, TCLP	0.075	mg/L	1	0.20	0.056	J	08/31/07 14:20
7440-39-3	Barium, TCLP	1.3	mg/L	1	0.35	0.0010		08/31/07 14:20
7440-43-9	Cadmium, TCLP	0.0071	mg/L	1	0.020	0.0045	J	08/31/07 14:20
7440-47-3	Chromium, TCLP	0.050	mg/L	1	0.050	0.0034	U	08/31/07 14:20
7439-92-1	Lead, TCLP	0.10	mg/L	1	0.10	0.030	U	08/31/07 14:20
7782-49-2	Selenium, TCLP	0.20	mg/L	1	0.20	0.064	U	08/31/07 14:20
7440-22-4	Silver, TCLP	0.010	mg/L	1	0.010	0.0029	U	08/31/07 14:20

00128

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

SWMU 40 IDM-Soil

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: TCLP
Sampled: 08/23/07 09:40
Solids: 0.00
Laboratory ID: 0708474-03

SDG: 36440-40
Project: RFAAP SWMU 40
Preparation: 7470A TCLP Digestion
Prepared: 08/29/07 12:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709985

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, TCLP	0.00020	mg/L	1	0.00020	0.000039	U	08/30/07 15:45

INORGANIC ANALYSIS DATA SHEET
USEPA-9095

SWMU 40 IDM-Soil

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 08/23/07 09:40
Solids: 0.00
Laboratory ID: 0708474-04

SDG: 36440-40
Project: RFAAP SWMU 40
Preparation: General Inorganic Prep
Prepared: 08/30/07 07:10
Initial/Final: 105.42 g / 105.42 mL
QC Batch: 0710038

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Paint Filter Liquids Test	Pass	mL	1	1	1		08/30/07 07:10

00192

INORGANIC ANALYSIS DATA SHEET
USEPA-9045C

SWMU 40 IDM-Soil

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 08/23/07 09:40
Solids: 0.00
Laboratory ID: 0708474-04

SDG: 36440-40
Project: RFAAP SWMU 40
Preparation: Method-Specific Prepara
Prepared: 08/28/07 11:17
Initial/Final: 20 g / 20 mL
QC Batch: 0709902

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	pH	8.6	pH Units	1	1.0	1.0		08/28/07 11:25

00182

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

SWMU 40 IDM-Water

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-40 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708474-02 File ID: data005-0

Sampled: 08/23/07 09:30 Prepared: 08/28/07 15:21 Analyzed: 09/04/07 14:26

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709928 Sequence: 7090569 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.59	71	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

SWMU 40 IDM-Water

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-40 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708474-02 File ID: ata005-0

Sampled: 08/23/07 09:30 Prepared: 08/29/07 16:17 Analyzed: 08/30/07 18:45

Solids: Preparation: 8332 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709945 Sequence: 7090625 Calibration: 7H28022 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.58	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.61	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
1-Nitronaphthalene	3.21	3.13	97	50 - 150	

* Values outside of QC limits

00106

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

SWMU 40 IDM-Water

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: TCLP
Sampled: 08/23/07 09:30
Solids: 0.00
Laboratory ID: 0708474-01

SDG: 36440-40
Project: RFAAP SWMU 40
Preparation: 3010A TCLP Digestion
Prepared: 08/29/07 07:00
Initial/Final: 25 mL / 25 mL
QC Batch: 0709906

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, TCLP	0.20	mg/L	1	0.20	0.056	U	08/31/07 14:09
7440-39-3	Barium, TCLP	0.59	mg/L	1	0.35	0.0010		08/31/07 14:09
7440-43-9	Cadmium, TCLP	0.0067	mg/L	1	0.020	0.0045	J	08/31/07 14:09
7440-47-3	Chromium, TCLP	0.084	mg/L	1	0.050	0.0034		08/31/07 14:09
7439-92-1	Lead, TCLP	0.12	mg/L	1	0.10	0.030		08/31/07 14:09
7782-49-2	Selenium, TCLP	0.20	mg/L	1	0.20	0.064	U	08/31/07 14:09
7440-22-4	Silver, TCLP	0.010	mg/L	1	0.010	0.0029	U	08/31/07 14:09

00127

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

SWMU 40 IDM-Water

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: TCLP
Sampled: 08/23/07 09:30
Solids: 0.00
Laboratory ID: 0708474-01

SDG: 36440-40
Project: RFAAP SWMU 40
Preparation: 7470A TCLP Digestion
Prepared: 08/29/07 12:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709985

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, TCLP	0.000045	mg/L	1	0.00020	0.000039	J	08/30/07 15:40

INORGANIC ANALYSIS DATA SHEET
USEPA-410.4

SWMU 40 IDM-Water

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/23/07 09:30
Solids: 0.00
Laboratory ID: 0708474-02

SDG: 36440-40
Project: RFAAP SWMU 40
Preparation: 410.4 COD Digestion
Prepared: 08/29/07 13:00
Initial/Final: 2 mL / 2 mL
QC Batch: 0710060

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Chemical Oxygen Demand	5.3	mg/L	1	10	2.2	J	08/29/07 17:00

00160

INORGANIC ANALYSIS DATA SHEET
USEPA-9040B

SWMU 40 IDM-Water

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/23/07 09:30
Solids: 0.00
Laboratory ID: 0708474-02

SDG: 36440-40
Project: RFAAP SWMU 40
Preparation: Method-Specific Prepara
Prepared: 08/28/07 11:00
Initial/Final: 20 mL / 20 mL
QC Batch: 0709901

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	pH	10.3	pH Units	1	0.1	0.1		08/28/07 11:20

APPENDIX C.8

SITE-SPECIFIC SSL CALCULATIONS

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Site-Specific SSL(s) for alpha-BHC (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	1.06E-05	mg/L
C_w =	Target Leachate Conc =	2.13E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	4.346E-04	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.00E+03	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	22.4	L/kg
	Site-specific SSL =	**4.819E-03**	**mg/kg**

Site-Specific SSL(s) for beta-BHC (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	3.72E-05	mg/L
C_w =	Target Leachate Conc =	7.44E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	3.046E-05	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.00E+03	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	22.4	L/kg
	Site-specific SSL =	**1.687E-02**	**mg/kg**

Site-Specific SSL(s) for gamma-BHC (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	5.15E-05	mg/L
C_w =	Target Leachate Conc =	1.03E-03	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	5.740E-04	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.00E+03	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	22.344	L/kg
	Site-specific SSL =	**2.329E-02**	**mg/kg**

Site-Specific SSL(s) for Benzene (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	3.36E-04	mg/L
C_w =	Target Leachate Conc =	6.72E-03	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	2.276E-01	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	3.10E+01	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	0.3472	L/kg
	Site-specific SSL =	**4.116E-03**	**mg/kg**

Site-Specific SSL(s) for Chlorobenzene (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	8.96E-02	mg/L
C_w =	Target Leachate Conc =	1.79E+00	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	1.517E-01	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	8.20E+01	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	0.9184	L/kg
	Site-specific SSL =	**2.122E+00**	**mg/kg**

Site-Specific SSL(s) for 1,2-Dibromo-3-chloropropane (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	2.00E-07	mg/L
C_w =	Target Leachate Conc =	4.00E-06	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	6.027E-03	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	3.60E+02	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	4.032	L/kg
	Site-specific SSL =	**1.719E-05**	**mg/kg**

Site-Specific SSL(s) for 1,4-Dichlorobenzene using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	2.81E-04	mg/L
C_w =	Target Leachate Conc =	5.63E-03	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	9.840E-02	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.73E+02	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	3.0576	L/kg
	Site-specific SSL =	**1.870E-02**	**mg/kg**

Site-Specific SSL(s) for Methylene Chloride (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	4.10E-03	mg/L
C_w =	Target Leachate Conc =	8.20E-02	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	8.979E-02	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.20E+01	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	0.1344	L/kg
	Site-specific SSL =	**3.276E-02**	**mg/kg**

Site-Specific SSL(s) for Trichloroethene (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	2.60E-05	mg/L
C_w =	Target Leachate Conc =	5.20E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.04125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	4.223E-01	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.30E+02	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.456	L/kg
	Site-specific SSL =	**7.719E-04**	**mg/kg**

Site-Specific SSL(s) for Vinyl Chloride (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	1.50E-05	mg/L
C_w =	Target Leachate Conc =	3.00E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	1.107E+00	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	5.60E+01	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	0.6272	L/kg
	Site-specific SSL =	**2.691E-04**	**mg/kg**

Site-Specific SSL(s) for Aroclor 1254 (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	3.35E-05	mg/L
C_w =	Target Leachate Conc =	6.70E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	1.160E-02	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	8.10E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	9072	L/kg
	Site-specific SSL =	**6.076E+00**	**mg/kg**

Site-Specific SSL(s) for N-Nitrosodiphenylamine (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	1.37E-02	mg/L
C_w =	Target Leachate Conc =	2.73E-01	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	2.050E-04	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.29E+03	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	14.448	L/kg
	Site-specific SSL =	**4.022E+00**	**mg/kg**

Site-Specific SSL(s) for Benzo(a)anthracene (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	3.00E-05	mg/L
C_w =	Target Leachate Conc =	6.00E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	1.374E-04	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	3.98E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	4,458	L/kg
	Site-specific SSL =	**2.675E+00**	**mg/kg**

Site-Specific SSL(s) for Benzo(a)pyrene (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	3.00E-06	mg/L
C_w =	Target Leachate Conc =	6.00E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	4.633E-05	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.02E+06	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	11,424	L/kg
	Site-specific SSL =	**6.855E-01**	**mg/kg**

Site-Specific SSL(s) for Naphthalene (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	6.50E-03	mg/L
C_w =	Target Leachate Conc =	1.30E-01	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	1.980E-02	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	4.90E+02	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	5.488	L/kg
	Site-specific SSL =	**7.478E-01**	**mg/kg**

Site-Specific SSL(s) for 2,3,7,8-TCDD TEQ (using C_w = T-RBC)
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	20	--
T-RBC	GW Concentration Source=	4.46E-10	mg/L
C_w =	Target Leachate Conc =	8.93E-09	mg/L
θ_w =	Water-Filled Soil Porosity =	0.4125	--
θ_a=	Air-Filled Soil Porosity =	0.0075	--
H' =	Henry's Law Constant =	2.040E-03	--
P_b =	Dry Soil Bulk Density =	1.56	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.46E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.0112	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1,635	L/kg
	Site-specific SSL =	**1.460E-05**	**mg/kg**

APPENDIX C.9

EXPOSURE POINT CONCENTRATION STATISTICAL RESULTS

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Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Full Data Sets

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ALUMINUM

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		**Log-transformed Statistics**	
Minimum	659	Minimum of Log Data	6.491
Maximum	28500	Maximum of Log Data	10.26
Mean	14470	Mean of log Data	9.37
Median	14500	SD of log Data	0.89
SD	6219		
Coefficient of Variation	0.43		
Skewness	-0.445		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.913	Shapiro Wilk Test Statistic	0.637
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	16945	95% H-UCL	29276
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33503
95% Adjusted-CLT UCL	16662	97.5% Chebyshev (MVUE) UCL	40663
95% Modified-t UCL	16920	99% Chebyshev (MVUE) UCL	54728

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.167	Data appear Normal at 5% Significance Level	
Theta Star	6678		
nu star	82.34		
Approximate Chi Square Value (.05)	62.43	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	16817
Adjusted Chi Square Value	60.91	95% Jackknife UCL	16945
		95% Standard Bootstrap UCL	16749
Anderson-Darling Test Statistic	2.098	95% Bootstrap-t UCL	16750
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	16930
Kolmogorov-Smirnov Test Statistic	0.322	95% Percentile Bootstrap UCL	16711
Kolmogorov-Smirnov 5% Critical Value	0.2	95% BCA Bootstrap UCL	16683
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20690
		97.5% Chebyshev(Mean, Sd) UCL	23381
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	28667
95% Approximate Gamma UCL	19086		
95% Adjusted Gamma UCL	19560		

Potential UCL to Use		Use 95% Student's-t UCL	16945

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.3	Minimum of Log Data	0.262
Maximum	55	Maximum of Log Data	4.007
Mean	9.944	Mean of log Data	1.732
Median	4.5	SD of log Data	0.908
SD	15.67		
Coefficient of Variation	1.576		
Skewness	2.72		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.476	Shapiro Wilk Test Statistic	0.81
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	16.18	95% H-UCL	14.56
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.57
95% Adjusted-CLT UCL	18.25	97.5% Chebyshev (MVUE) UCL	20.15
95% Modified-t UCL	16.55	99% Chebyshev (MVUE) UCL	27.19
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.893	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.14		
nu star	33.93		
Approximate Chi Square Value (.05)	21.61	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	15.86
Adjusted Chi Square Value	20.75	95% Jackknife UCL	16.18
		95% Standard Bootstrap UCL	15.66
Anderson-Darling Test Statistic	2.69	95% Bootstrap-t UCL	53.23
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	50.16
Kolmogorov-Smirnov Test Statistic	0.313	95% Percentile Bootstrap UCL	15.83
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	18.29
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	25.61
		97.5% Chebyshev(Mean, Sd) UCL	32.39
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	45.71
95% Approximate Gamma UCL	15.61		
95% Adjusted Gamma UCL	16.26		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	25.61

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CALCIUM

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	457	Minimum of Log Data	6.125
Maximum	26300	Maximum of Log Data	10.18
Mean	6453	Mean of log Data	8.348
Median	4100	SD of log Data	0.996
SD	6343		
Coefficient of Variation	0.983		
Skewness	1.97		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.792	Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8976	95% H-UCL	12835
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14114
95% Adjusted-CLT UCL	9549	97.5% Chebyshev (MVUE) UCL	17327
95% Modified-t UCL	9086	99% Chebyshev (MVUE) UCL	23637
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.148	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	5623		
nu star	43.61		
Approximate Chi Square Value (.05)	29.47	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	8846
Adjusted Chi Square Value	28.45	95% Jackknife UCL	8976
		95% Standard Bootstrap UCL	8765
Anderson-Darling Test Statistic	0.279	95% Bootstrap-t UCL	10588
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	12393
Kolmogorov-Smirnov Test Statistic	0.146	95% Percentile Bootstrap UCL	8932
Kolmogorov-Smirnov 5% Critical Value	0.203	95% BCA Bootstrap UCL	9289
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12796
		97.5% Chebyshev(Mean, Sd) UCL	15540
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20931
95% Approximate Gamma UCL	9550		
95% Adjusted Gamma UCL	9891		
Potential UCL to Use		Use 95% Approximate Gamma UCL	9550

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	4.1	Minimum of Log Data	1.411
Maximum	37.6	Maximum of Log Data	3.627
Mean	22.86	Mean of log Data	3.039
Median	22.7	SD of log Data	0.513
SD	7.771		
Coefficient of Variation	0.34		
Skewness	-0.723		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.925	Shapiro Wilk Test Statistic	0.729
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	25.95	95% H-UCL	30.43
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	36.21
95% Adjusted-CLT UCL	25.48	97.5% Chebyshev (MVUE) UCL	41.65
95% Modified-t UCL	25.91	99% Chebyshev (MVUE) UCL	52.34
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.806	Data appear Normal at 5% Significance Level	
Theta Star	4.757		
nu star	182.6		
Approximate Chi Square Value (.05)	152.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	25.8
Adjusted Chi Square Value	150	95% Jackknife UCL	25.95
		95% Standard Bootstrap UCL	25.73
Anderson-Darling Test Statistic	1.448	95% Bootstrap-t UCL	25.73
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	25.8
Kolmogorov-Smirnov Test Statistic	0.266	95% Percentile Bootstrap UCL	25.6
Kolmogorov-Smirnov 5% Critical Value	0.199	95% BCA Bootstrap UCL	25.35
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	30.63
		97.5% Chebyshev(Mean, Sd) UCL	34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	40.6
95% Approximate Gamma UCL	27.4		
95% Adjusted Gamma UCL	27.84		
Potential UCL to Use		Use 95% Student's-t UCL	25.95

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	14
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.8	Minimum of Log Data	0.588
Maximum	13.2	Maximum of Log Data	2.58
Mean	6.771	Mean of log Data	1.829
Median	6.6	SD of log Data	0.451
SD	2.634		
Coefficient of Variation	0.389		
Skewness	0.539		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.939	Shapiro Wilk Test Statistic	0.894
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	7.819	95% H-UCL	8.501
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.04
95% Adjusted-CLT UCL	7.845	97.5% Chebyshev (MVUE) UCL	11.41
95% Modified-t UCL	7.831	99% Chebyshev (MVUE) UCL	14.12
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.193	Data appear Normal at 5% Significance Level	
Theta Star	1.304		
nu star	197.3		
Approximate Chi Square Value (.05)	165.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	7.765
Adjusted Chi Square Value	163.3	95% Jackknife UCL	7.819
		95% Standard Bootstrap UCL	7.748
Anderson-Darling Test Statistic	0.658	95% Bootstrap-t UCL	7.894
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	8.066
Kolmogorov-Smirnov Test Statistic	0.227	95% Percentile Bootstrap UCL	7.784
Kolmogorov-Smirnov 5% Critical Value	0.199	95% BCA Bootstrap UCL	7.829
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.405
		97.5% Chebyshev(Mean, Sd) UCL	10.54
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.78
95% Approximate Gamma UCL	8.057		
95% Adjusted Gamma UCL	8.182		
Potential UCL to Use		Use 95% Student's-t UCL	7.819

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COPPER

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	18
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.16	Minimum of Log Data	-1.833
Maximum	76	Maximum of Log Data	4.331
Mean	18.95	Mean of log Data	2.304
Median	11.6	SD of log Data	1.413
SD	20.11		
Coefficient of Variation	1.061		
Skewness	1.665		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.8	Shapiro Wilk Test Statistic	0.905
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	26.95	95% H-UCL	80.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	65.9
95% Adjusted-CLT UCL	28.42	97.5% Chebyshev (MVUE) UCL	83.7
95% Modified-t UCL	27.25	99% Chebyshev (MVUE) UCL	118.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.805	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	23.53		
nu star	30.61		
Approximate Chi Square Value (.05)	18.97	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	26.54
Adjusted Chi Square Value	18.17	95% Jackknife UCL	26.95
		95% Standard Bootstrap UCL	26.29
Anderson-Darling Test Statistic	0.297	95% Bootstrap-t UCL	30.25
Anderson-Darling 5% Critical Value	0.772	95% Hall's Bootstrap UCL	29.22
Kolmogorov-Smirnov Test Statistic	0.153	95% Percentile Bootstrap UCL	26.98
Kolmogorov-Smirnov 5% Critical Value	0.205	95% BCA Bootstrap UCL	28.69
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.06
		97.5% Chebyshev(Mean, Sd) UCL	47.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	64.86
95% Approximate Gamma UCL	30.57		
95% Adjusted Gamma UCL	31.92		
Potential UCL to Use		Use 95% Approximate Gamma UCL	30.57

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	1440	Minimum of Log Data	7.272
Maximum	32000	Maximum of Log Data	10.37
Mean	22272	Mean of log Data	9.835
Median	23900	SD of log Data	0.821
SD	7844		
Coefficient of Variation	0.352		
Skewness	-1.952		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.748	Shapiro Wilk Test Statistic	0.524
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	25392	95% H-UCL	41447
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	48338
95% Adjusted-CLT UCL	24370	97.5% Chebyshev (MVUE) UCL	58188
95% Modified-t UCL	25258	99% Chebyshev (MVUE) UCL	77538
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.559	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8704		
nu star	97.23		
Approximate Chi Square Value (.05)	75.49	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	25232
Adjusted Chi Square Value	73.81	95% Jackknife UCL	25392
		95% Standard Bootstrap UCL	25140
Anderson-Darling Test Statistic	3.468	95% Bootstrap-t UCL	24813
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	24615
Kolmogorov-Smirnov Test Statistic	0.386	95% Percentile Bootstrap UCL	24974
Kolmogorov-Smirnov 5% Critical Value	0.2	95% BCA Bootstrap UCL	24463
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	30115
		97.5% Chebyshev(Mean, Sd) UCL	33510
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	40177
95% Approximate Gamma UCL	28687		
95% Adjusted Gamma UCL	29338		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	30115

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	3.8	Minimum of Log Data	1.335
Maximum	110	Maximum of Log Data	4.7
Mean	27.45	Mean of log Data	3.043
Median	19.5	SD of log Data	0.705
SD	26.53		
Coefficient of Variation	0.967		
Skewness	2.578		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.589	Shapiro Wilk Test Statistic	0.837
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	38.01	95% H-UCL	38.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	46.36
95% Adjusted-CLT UCL	41.31	97.5% Chebyshev (MVUE) UCL	54.97
95% Modified-t UCL	38.61	99% Chebyshev (MVUE) UCL	71.88
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.723	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.93		
nu star	65.48		
Approximate Chi Square Value (.05)	47.86	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	37.47
Adjusted Chi Square Value	46.54	95% Jackknife UCL	38.01
		95% Standard Bootstrap UCL	37.32
Anderson-Darling Test Statistic	2.05	95% Bootstrap-t UCL	66.11
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	95.25
Kolmogorov-Smirnov Test Statistic	0.321	95% Percentile Bootstrap UCL	37.73
Kolmogorov-Smirnov 5% Critical Value	0.201	95% BCA Bootstrap UCL	41.7
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	53.99
		97.5% Chebyshev(Mean, Sd) UCL	65.47
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	88.02
95% Approximate Gamma UCL	37.56		
95% Adjusted Gamma UCL	38.62		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	53.99

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	18
Raw Statistics		**Log-transformed Statistics**	
Minimum	10.7	Minimum of Log Data	2.37
Maximum	894	Maximum of Log Data	6.796
Mean	333.9	Mean of log Data	5.501
Median	318	SD of log Data	1.041
SD	206.9		
Coefficient of Variation	0.62		
Skewness	0.932		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.935	Shapiro Wilk Test Statistic	0.779
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	416.2	95% H-UCL	813.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	875.8
95% Adjusted-CLT UCL	422.8	97.5% Chebyshev (MVUE) UCL	1080
95% Modified-t UCL	417.9	99% Chebyshev (MVUE) UCL	1481
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.519	Data appear Normal at 5% Significance Level	
Theta Star	219.8		
nu star	57.72		
Approximate Chi Square Value (.05)	41.26	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	412
Adjusted Chi Square Value	40.04	95% Jackknife UCL	416.2
		95% Standard Bootstrap UCL	411.7
Anderson-Darling Test Statistic	0.847	95% Bootstrap-t UCL	429.7
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	449
Kolmogorov-Smirnov Test Statistic	0.22	95% Percentile Bootstrap UCL	416.2
Kolmogorov-Smirnov 5% Critical Value	0.201	95% BCA Bootstrap UCL	430.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	540.8
		97.5% Chebyshev(Mean, Sd) UCL	630.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	806.3
95% Approximate Gamma UCL	467.2		
95% Adjusted Gamma UCL	481.4		
Potential UCL to Use		Use 95% Student's-t UCL	416.2

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NICKEL

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	16
Raw Statistics		**Log-transformed Statistics**	
Minimum	4.3	Minimum of Log Data	1.459
Maximum	20.9	Maximum of Log Data	3.04
Mean	9.895	Mean of log Data	2.185
Median	7.4	SD of log Data	0.463
SD	5.025		
Coefficient of Variation	0.508		
Skewness	1.133		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.841	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	11.89	95% H-UCL	12.28
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.53
95% Adjusted-CLT UCL	12.11	97.5% Chebyshev (MVUE) UCL	16.56
95% Modified-t UCL	11.94	99% Chebyshev (MVUE) UCL	20.56
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.089	Data appear Lognormal at 5% Significance Level	
Theta Star	2.42		
nu star	155.4		
Approximate Chi Square Value (.05)	127.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	11.79
Adjusted Chi Square Value	125.4	95% Jackknife UCL	11.89
		95% Standard Bootstrap UCL	11.74
Anderson-Darling Test Statistic	0.822	95% Bootstrap-t UCL	12.31
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	11.89
Kolmogorov-Smirnov Test Statistic	0.201	95% Percentile Bootstrap UCL	11.74
Kolmogorov-Smirnov 5% Critical Value	0.199	95% BCA Bootstrap UCL	12.13
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.92
		97.5% Chebyshev(Mean, Sd) UCL	17.09
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.37
95% Approximate Gamma UCL	12.05		
95% Adjusted Gamma UCL	12.26		
Potential UCL to Use		Use 95% Student's-t UCL	11.89
		or 95% Modified-t UCL	11.94
		or 95% H-UCL	12.28

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

VANADIUM

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	18
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.4	Minimum of Log Data	1.686
Maximum	56.9	Maximum of Log Data	4.041
Mean	39.97	Mean of log Data	3.546
Median	43.5	SD of log Data	0.666
SD	15.37		
Coefficient of Variation	0.385		
Skewness	-1.31		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.83	Shapiro Wilk Test Statistic	0.676
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	46.09	95% H-UCL	61.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	72.83
95% Adjusted-CLT UCL	44.64	97.5% Chebyshev (MVUE) UCL	85.87
95% Modified-t UCL	45.91	99% Chebyshev (MVUE) UCL	111.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.121	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.81		
nu star	118.6		
Approximate Chi Square Value (.05)	94.46	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	45.77
Adjusted Chi Square Value	92.58	95% Jackknife UCL	46.09
		95% Standard Bootstrap UCL	45.5
Anderson-Darling Test Statistic	2.213	95% Bootstrap-t UCL	44.88
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	44.54
Kolmogorov-Smirnov Test Statistic	0.342	95% Percentile Bootstrap UCL	45.22
Kolmogorov-Smirnov 5% Critical Value	0.199	95% BCA Bootstrap UCL	44.51
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	55.35
		97.5% Chebyshev(Mean, Sd) UCL	62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	75.06
95% Approximate Gamma UCL	50.19		
95% Adjusted Gamma UCL	51.21		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	55.35

Table C.9-1
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ZINC

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.5	Minimum of Log Data	1.705
Maximum	148	Maximum of Log Data	4.997
Mean	59.84	Mean of log Data	3.837
Median	42.9	SD of log Data	0.803
SD	40.55		
Coefficient of Variation	0.678		
Skewness	0.868		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.911	Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	75.97	95% H-UCL	99.95
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	117
95% Adjusted-CLT UCL	77.12	97.5% Chebyshev (MVUE) UCL	140.6
95% Modified-t UCL	76.28	99% Chebyshev (MVUE) UCL	186.8
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.817	Data appear Normal at 5% Significance Level	
Theta Star	32.92		
nu star	69.06		
Approximate Chi Square Value (.05)	50.93	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	75.14
Adjusted Chi Square Value	49.57	95% Jackknife UCL	75.97
		95% Standard Bootstrap UCL	74.59
Anderson-Darling Test Statistic	0.26	95% Bootstrap-t UCL	78.61
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	76.71
Kolmogorov-Smirnov Test Statistic	0.122	95% Percentile Bootstrap UCL	75.22
Kolmogorov-Smirnov 5% Critical Value	0.201	95% BCA Bootstrap UCL	75.38
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	100.4
		97.5% Chebyshev(Mean, Sd) UCL	117.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	152.4
95% Approximate Gamma UCL	81.14		
95% Adjusted Gamma UCL	83.36		
Potential UCL to Use		Use 95% Student's-t UCL	75.97

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

CADMIUM

General Statistics

Number of Valid Samples	19	Number of Detected Data	8
Number of Unique Samples	7	Number of Non-Detect Data	11
		Percent Non-Detects	57.89%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.09	Minimum Detected	-2.408
Maximum Detected	0.75	Maximum Detected	-0.288
Mean of Detected	0.261	Mean of Detected	-1.605
SD of Detected	0.222	SD of Detected	0.752
Minimum Non-Detect	0.03	Minimum Non-Detect	-3.507
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	11
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	8
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	57.89%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.792	Shapiro Wilk Test Statistic	0.924
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.122	Mean	-2.924
SD	0.184	SD	1.255
95% DL/2 (t) UCL	0.195	95% H-Stat (DL/2) UCL	0.16

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.992
		SD in Log Scale	1.4
		Mean in Original Scale	0.123
		SD in Original Scale	0.184
		95% Percentile Bootstrap UCL	0.196
		95% BCA Bootstrap UCL	0.221

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.366
Theta Star	0.191
nu star	21.85
A-D Test Statistic	0.388
5% A-D Critical Value	0.724
K-S Test Statistic	0.724
5% K-S Critical Value	0.297
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.09
Maximum	0.75
Mean	0.259
Median	0.245
SD	0.14
k star	3.88
Theta star	0.0667
Nu star	147.4
AppChi2	120.4
95% Gamma Approximate UCL	0.317
95% Adjusted Gamma UCL	0.323

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.162
SD	0.159
SE of Mean	0.039
95% KM (t) UCL	0.23
95% KM (z) UCL	0.226
95% KM (jackknife) UCL	0.227
95% KM (bootstrap t) UCL	0.3
95% KM (BCA) UCL	0.258
95% KM (Percentile Bootstrap) UCL	0.237
95% KM (Chebyshev) UCL	0.332
97.5% KM (Chebyshev) UCL	0.405
99% KM (Chebyshev) UCL	0.55
Potential UCLs to Use	
95% KM (t) UCL	0.23

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COPPER

General Statistics

Number of Valid Samples	19	Number of Detected Data	18
Number of Unique Samples	17	Number of Non-Detect Data	1
		Percent Non-Detects	5.26%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.1	Minimum Detected	0.742
Maximum Detected	76	Maximum Detected	4.331
Mean of Detected	19.99	Mean of Detected	2.534
SD of Detected	20.16	SD of Detected	1.025
Minimum Non-Detect	0.16	Minimum Non-Detect	-1.833
Maximum Non-Detect	0.16	Maximum Non-Detect	-1.833

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.797	Shapiro Wilk Test Statistic	0.964
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	18.95	Mean	2.268
SD	20.12	SD	1.53
95% DL/2 (t) UCL	26.95	95% H-Stat (DL/2) UCL	78.77
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	18.36	Mean in Log Scale	2.401
SD	20.4	SD in Log Scale	1.152
95% MLE (t) UCL	26.48	Mean in Original Scale	19
95% MLE (Tiku) UCL	26.09	SD in Original Scale	20.07
		95% Percentile Bootstrap UCL	27.18
		95% BCA Bootstrap UCL	28.37

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.056
Theta Star	18.93
nu star	38.02
A-D Test Statistic	0.441
5% A-D Critical Value	0.762
K-S Test Statistic	0.762
5% K-S Critical Value	0.208
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	76
Mean	18.94
Median	11.6
SD	20.12
k star	0.374
Theta star	50.6
Nu star	14.22
AppChi2	6.725
95% Gamma Approximate UCL	40.06
95% Adjusted Gamma UCL	42.92

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	19.05
SD	19.48
SE of Mean	4.599
95% KM (t) UCL	27.03
95% KM (z) UCL	26.62
95% KM (jackknife) UCL	27
95% KM (bootstrap t) UCL	30.83
95% KM (BCA) UCL	27.06
95% KM (Percentile Bootstrap) UCL	26.75
95% KM (Chebyshev) UCL	39.1
97.5% KM (Chebyshev) UCL	47.77
99% KM (Chebyshev) UCL	64.81
Potential UCLs to Use	
95% KM (Chebyshev) UCL	39.1

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MERCURY

General Statistics

Number of Valid Samples	19	Number of Detected Data	18
Number of Unique Samples	17	Number of Non-Detect Data	1
		Percent Non-Detects	5.26%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.042	Minimum Detected	-3.17
Maximum Detected	2.1	Maximum Detected	0.742
Mean of Detected	0.254	Mean of Detected	-2.109
SD of Detected	0.492	SD of Detected	1.014
Minimum Non-Detect	0.023	Minimum Non-Detect	-3.772
Maximum Non-Detect	0.023	Maximum Non-Detect	-3.772

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.454	Shapiro Wilk Test Statistic	0.816
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.242	Mean	-2.233
SD	0.482	SD	1.124
95% DL/2 (t) UCL	0.433	95% H-Stat (DL/2) UCL	0.352
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.225	Mean in Log Scale	-2.231
SD	0.486	SD in Log Scale	1.119
95% MLE (t) UCL	0.418	Mean in Original Scale	0.242
95% MLE (Tiku) UCL	0.401	SD in Original Scale	0.482
		95% Percentile Bootstrap UCL	0.448
		95% BCA Bootstrap UCL	0.562

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.705
Theta Star	0.361
nu star	25.36
A-D Test Statistic	2.345
5% A-D Critical Value	0.776
K-S Test Statistic	0.776
5% K-S Critical Value	0.211
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	2.1
Mean	0.241
Median	0.084
SD	0.482
k star	0.368
Theta star	0.655
Nu star	13.99
AppChi2	6.566
95% Gamma Approximate UCL	0.514
95% Adjusted Gamma UCL	0.551

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.243
SD	0.468
SE of Mean	0.111
95% KM (t) UCL	0.435
95% KM (z) UCL	0.425
95% KM (jackknife) UCL	0.434
95% KM (bootstrap t) UCL	1.291
95% KM (BCA) UCL	0.449
95% KM (Percentile Bootstrap) UCL	0.43
95% KM (Chebyshev) UCL	0.725
97.5% KM (Chebyshev) UCL	0.933
99% KM (Chebyshev) UCL	1.343
Potential UCLs to Use	
97.5% KM (Chebyshev) UCL	0.933

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SELENIUM

General Statistics

Number of Valid Samples	19	Number of Detected Data	18
Number of Unique Samples	14	Number of Non-Detect Data	1
		Percent Non-Detects	5.26%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.475	Minimum Detected	-0.744
Maximum Detected	3.3	Maximum Detected	1.194
Mean of Detected	1.381	Mean of Detected	0.213
SD of Detected	0.713	SD of Detected	0.48
Minimum Non-Detect	0.42	Minimum Non-Detect	-0.868
Maximum Non-Detect	0.42	Maximum Non-Detect	-0.868

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.824	Shapiro Wilk Test Statistic	0.938
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.319	Mean	0.12
SD	0.743	SD	0.619
95% DL/2 (t) UCL	1.615	95% H-Stat (DL/2) UCL	1.657
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.311	Mean in Log Scale	0.153
SD	0.739	SD in Log Scale	0.536
95% MLE (t) UCL	1.605	Mean in Original Scale	1.329
95% MLE (Tiku) UCL	1.599	SD in Original Scale	0.729
		95% Percentile Bootstrap UCL	1.616
		95% BCA Bootstrap UCL	1.652

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	3.966
Theta Star	0.348
nu star	142.8
A-D Test Statistic	0.646
5% A-D Critical Value	0.743
K-S Test Statistic	0.743
5% K-S Critical Value	0.204
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.0265
Maximum	3.3
Mean	1.31
Median	1.2
SD	0.759
k star	1.788
Theta star	0.732
Nu star	67.94
AppChi2	49.97
95% Gamma Approximate UCL	1.781
95% Adjusted Gamma UCL	1.83

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	1.333
SD	0.704
SE of Mean	0.166
95% KM (t) UCL	1.621
95% KM (z) UCL	1.606
95% KM (jackknife) UCL	1.62
95% KM (bootstrap t) UCL	1.774
95% KM (BCA) UCL	1.657
95% KM (Percentile Bootstrap) UCL	1.608
95% KM (Chebyshev) UCL	2.057
97.5% KM (Chebyshev) UCL	2.371
99% KM (Chebyshev) UCL	2.986
Potential UCLs to Use	
95% KM (BCA) UCL	1.657

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

THALLIUM

General Statistics

Number of Valid Samples	14	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	12
		Percent Non-Detects	85.71%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.49	Minimum Detected	-0.713
Maximum Detected	1.3	Maximum Detected	0.262
Mean of Detected	0.895	Mean of Detected	-0.225
SD of Detected	0.573	SD of Detected	0.69
Minimum Non-Detect	0.27	Minimum Non-Detect	-1.309
Maximum Non-Detect	0.64	Maximum Non-Detect	-0.446

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	13
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	92.86%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.301	Mean	-1.453
SD	0.306	SD	0.645
95% DL/2 (t) UCL	0.446	95% H-Stat (DL/2) UCL	0.446

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.359	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.548
5% K-S Critical Value	N/A	SD	0.209
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0788
		95% KM (t) UCL	0.687
Assuming Gamma Distribution		95% KM (z) UCL	0.678
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.095
Minimum	N/A	95% KM (bootstrap t) UCL	1.8E+308
Maximum	N/A	95% KM (BCA) UCL	1.3
Mean	N/A	95% KM (Percentile Bootstrap) UCL	1.3
Median	N/A	95% KM (Chebyshev) UCL	0.892
SD	N/A	97.5% KM (Chebyshev) UCL	1.04
k star	N/A	99% KM (Chebyshev) UCL	1.332
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	0.687
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	1.3
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR-1254

General Statistics

Number of Valid Samples	28	Number of Detected Data	25
Number of Unique Samples	24	Number of Non-Detect Data	3
		Percent Non-Detects	10.71%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	20	Minimum Detected	2.996
Maximum Detected	2100	Maximum Detected	7.65
Mean of Detected	216.5	Mean of Detected	4.61
SD of Detected	415.3	SD of Detected	1.142
Minimum Non-Detect	9	Minimum Non-Detect	2.197
Maximum Non-Detect	9	Maximum Non-Detect	2.197

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.459	Shapiro Wilk Test Statistic	0.953
5% Shapiro Wilk Critical Value	0.918	5% Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	193.8	Mean	4.277
SD	397.2	SD	1.454
95% DL/2 (t) UCL	321.6	95% H-Stat (DL/2) UCL	429.4
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	163.7	Mean in Log Scale	4.324
SD	420.2	SD in Log Scale	1.37
95% MLE (t) UCL	299	Mean in Original Scale	194.1
95% MLE (Tiku) UCL	289.7	SD in Original Scale	397.1
		95% Percentile Bootstrap UCL	332.9
		95% BCA Bootstrap UCL	409.9

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.71
Theta Star	305
nu star	35.48
A-D Test Statistic	1.21
5% A-D Critical Value	0.782
K-S Test Statistic	0.782
5% K-S Critical Value	0.181
Data follow Appr. Gamma Distribution at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	2100
Mean	193.3
Median	67
SD	397.5
k star	0.217
Theta star	892.5
Nu star	12.13
AppChi2	5.31
95% Gamma Approximate UCL	441.3
95% Adjusted Gamma UCL	465.7

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data Follow Appr. Gamma Distribution at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	195.4
SD	389.3
SE of Mean	75.09
95% KM (t) UCL	323.3
95% KM (z) UCL	318.9
95% KM (jackknife) UCL	322.8
95% KM (bootstrap t) UCL	565.2
95% KM (BCA) UCL	349.4
95% KM (Percentile Bootstrap) UCL	332.4
95% KM (Chebyshev) UCL	522.7
97.5% KM (Chebyshev) UCL	664.3
99% KM (Chebyshev) UCL	942.5
Potential UCLs to Use	
95% KM (Chebyshev) UCL	522.7

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR-1260

General Statistics

Number of Valid Samples	28	Number of Detected Data	8
Number of Unique Samples	8	Number of Non-Detect Data	20
		Percent Non-Detects	71.43%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	18	Minimum Detected	2.89
Maximum Detected	230	Maximum Detected	5.438
Mean of Detected	87.38	Mean of Detected	4.104
SD of Detected	75.86	SD of Detected	0.946
Minimum Non-Detect	5.4	Minimum Non-Detect	1.686
Maximum Non-Detect	21	Maximum Non-Detect	3.045

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	21
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	75.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.873	Shapiro Wilk Test Statistic	0.942
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	28.17	Mean	2.216
SD	54.3	SD	1.328
95% DL/2 (t) UCL	45.65	95% H-Stat (DL/2) UCL	34.15

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.616
		SD in Log Scale	1.914
		Mean in Original Scale	27.1
		SD in Original Scale	54.82
		95% Percentile Bootstrap UCL	45.5
		95% BCA Bootstrap UCL	51.56

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.027
Theta Star	85.08
nu star	16.43
A-D Test Statistic	0.298
5% A-D Critical Value	0.728
K-S Test Statistic	0.728
5% K-S Critical Value	0.299
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	230
Mean	71.17
Median	54.78
SD	62.97
k star	0.203
Theta star	351.2
Nu star	11.35
AppChi2	4.8
95% Gamma Approximate UCL	168.2
95% Adjusted Gamma UCL	177.9

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	37.82
SD	49.2
SE of Mean	9.941
95% KM (t) UCL	54.75
95% KM (z) UCL	54.17
95% KM (jackknife) UCL	52.49
95% KM (bootstrap t) UCL	63.05
95% KM (BCA) UCL	72.57
95% KM (Percentile Bootstrap) UCL	61.14
95% KM (Chebyshev) UCL	81.15
97.5% KM (Chebyshev) UCL	99.9
99% KM (Chebyshev) UCL	136.7
Potential UCLs to Use	
95% KM (t) UCL	54.75
95% KM (Percentile Bootstrap) UCL	61.14

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ALDRIN

General Statistics

Number of Valid Samples	17	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	15
		Percent Non-Detects	88.24%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.1	Minimum Detected	0.742
Maximum Detected	5.1	Maximum Detected	1.629
Mean of Detected	3.6	Mean of Detected	1.186
SD of Detected	2.121	SD of Detected	0.627
Minimum Non-Detect	0.17	Minimum Non-Detect	-1.772
Maximum Non-Detect	0.17	Maximum Non-Detect	-1.772

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.499	Mean	-2.036
SD	1.282	SD	1.223
95% DL/2 (t) UCL	1.041	95% H-Stat (DL/2) UCL	0.517

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.359	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	2.276
5% K-S Critical Value	N/A	SD	0.706
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.242
		95% KM (t) UCL	2.699
Assuming Gamma Distribution		95% KM (z) UCL	2.675
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	4.28
Minimum	N/A	95% KM (bootstrap t) UCL	2.276
Maximum	N/A	95% KM (BCA) UCL	5.1
Mean	N/A	95% KM (Percentile Bootstrap) UCL	5.1
Median	N/A	95% KM (Chebyshev) UCL	3.332
SD	N/A	97.5% KM (Chebyshev) UCL	3.788
k star	N/A	99% KM (Chebyshev) UCL	4.685
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	2.699
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	5.1
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ALPHA-CHLORDANE

General Statistics

Number of Valid Samples	17	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	14
		Percent Non-Detects	82.35%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.49	Minimum Detected	-0.713
Maximum Detected	3.2	Maximum Detected	1.163
Mean of Detected	1.697	Mean of Detected	0.262
SD of Detected	1.379	SD of Detected	0.94
Minimum Non-Detect	0.22	Minimum Non-Detect	-1.514
Maximum Non-Detect	0.22	Maximum Non-Detect	-1.514

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.965	Shapiro Wilk Test Statistic	0.995
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.39	Mean	-1.772
SD	0.792	SD	1.026
95% DL/2 (t) UCL	0.725	95% H-Stat (DL/2) UCL	0.359

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.039
		SD in Log Scale	2.85
		Mean in Original Scale	0.325
		SD in Original Scale	0.817
		95% Percentile Bootstrap UCL	0.673
		95% BCA Bootstrap UCL	0.884

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.245	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.703
5% K-S Critical Value	N/A	SD	0.66
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.196
		95% KM (t) UCL	1.045
Assuming Gamma Distribution		95% KM (z) UCL	1.025
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.316
Minimum	N/A	95% KM (bootstrap t) UCL	0.964
Maximum	N/A	95% KM (BCA) UCL	3.2
Mean	N/A	95% KM (Percentile Bootstrap) UCL	3.2
Median	N/A	95% KM (Chebyshev) UCL	1.557
SD	N/A	97.5% KM (Chebyshev) UCL	1.927
k star	N/A	99% KM (Chebyshev) UCL	2.653
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	1.045
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	3.2
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BETA-BHC

General Statistics

Number of Valid Samples	17	Number of Detected Data	5
Number of Unique Samples	5	Number of Non-Detect Data	12
		Percent Non-Detects	70.59%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.1	Minimum Detected	0.742
Maximum Detected	12	Maximum Detected	2.485
Mean of Detected	6.76	Mean of Detected	1.771
SD of Detected	3.561	SD of Detected	0.64
Minimum Non-Detect	0.28	Minimum Non-Detect	-1.273
Maximum Non-Detect	0.28	Maximum Non-Detect	-1.273

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.963	Shapiro Wilk Test Statistic	0.912
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.087	Mean	-0.867
SD	3.583	SD	1.784
95% DL/2 (t) UCL	3.604	95% H-Stat (DL/2) UCL	5.082
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	6.979	Mean in Log Scale	0.116
SD	3.185	SD in Log Scale	1.379
95% MLE (t) UCL	8.328	Mean in Original Scale	2.542
95% MLE (Tiku) UCL	9.446	SD in Original Scale	3.361
		95% Percentile Bootstrap UCL	3.888
		95% BCA Bootstrap UCL	4.176

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.627	**Data appear Normal at 5% Significance Level**	
Theta Star	4.155		
nu star	16.27		
A-D Test Statistic	0.303	**Nonparametric Statistics**	
5% A-D Critical Value	0.682	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.682	Mean	3.471
5% K-S Critical Value	0.359	SD	2.737
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.742
		95% KM (t) UCL	4.766
Assuming Gamma Distribution		95% KM (z) UCL	4.691
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	5.666
Minimum	2.1	95% KM (bootstrap t) UCL	4.718
Maximum	21.07	95% KM (BCA) UCL	7.671
Mean	10.93	95% KM (Percentile Bootstrap) UCL	7.329
Median	10.77	95% KM (Chebyshev) UCL	6.706
SD	6.002	97.5% KM (Chebyshev) UCL	8.106
k star	2.327	99% KM (Chebyshev) UCL	10.86
Theta star	4.696		
Nu star	79.13	**Potential UCLs to Use**	
AppChi2	59.64	95% KM (t) UCL	4.766
95% Gamma Approximate UCL	14.5	95% KM (Percentile Bootstrap) UCL	7.329
95% Adjusted Gamma UCL	14.95		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

GAMMA-BHC (LINDANE)

General Statistics

Number of Valid Samples	17	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	15
		Percent Non-Detects	88.24%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.55	Minimum Detected	-0.598
Maximum Detected	11	Maximum Detected	2.398
Mean of Detected	5.775	Mean of Detected	0.9
SD of Detected	7.389	SD of Detected	2.118
Minimum Non-Detect	0.22	Minimum Non-Detect	-1.514
Maximum Non-Detect	0.22	Maximum Non-Detect	-1.514

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.776	Mean	-1.842
SD	2.637	SD	1.16
95% DL/2 (t) UCL	1.893	95% H-Stat (DL/2) UCL	0.474

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.355	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.165
5% K-S Critical Value	N/A	SD	2.459
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.843
		95% KM (t) UCL	2.637
Assuming Gamma Distribution		95% KM (z) UCL	2.552
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	8.145
Minimum	N/A	95% KM (bootstrap t) UCL	1.8E+308
Maximum	N/A	95% KM (BCA) UCL	11
Mean	N/A	95% KM (Percentile Bootstrap) UCL	11
Median	N/A	95% KM (Chebyshev) UCL	4.841
SD	N/A	97.5% KM (Chebyshev) UCL	6.432
k star	N/A	99% KM (Chebyshev) UCL	9.556
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	99% KM (Chebyshev) UCL	9.556
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

4-METHYL-2-PENTANONE

General Statistics			
Number of Valid Samples	17	Number of Detected Data	10
Number of Unique Samples	9	Number of Non-Detect Data	7
		Percent Non-Detects	41.18%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	3	Minimum Detected	1.099
Maximum Detected	31	Maximum Detected	3.434
Mean of Detected	13	Mean of Detected	2.272
SD of Detected	9.911	SD of Detected	0.832
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.8	Maximum Non-Detect	-0.223

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	7
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	10
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	41.18%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.88	Shapiro Wilk Test Statistic	0.93
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7.776	Mean	0.855
SD	9.832	SD	1.858
95% DL/2 (t) UCL	11.94	95% H-Stat (DL/2) UCL	74.5
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	3.723	Mean in Log Scale	1.379
SD	14.2	SD in Log Scale	1.285
95% MLE (t) UCL	9.735	Mean in Original Scale	8.13
95% MLE (Tiku) UCL	10.56	SD in Original Scale	9.556
		95% Percentile Bootstrap UCL	11.88
		95% BCA Bootstrap UCL	12.59

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.367
Theta Star	9.507
nu star	27.35
A-D Test Statistic	0.385
5% A-D Critical Value	0.737
K-S Test Statistic	0.737
5% K-S Critical Value	0.27
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	3
Maximum	31
Mean	10.96
Median	8.186
SD	8.236
k star	1.798
Theta star	6.094
Nu star	61.14
AppChi2	44.16
95% Gamma Approximate UCL	15.17
95% Adjusted Gamma UCL	15.71

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	8.882
SD	8.73
SE of Mean	2.232
95% KM (t) UCL	12.78
95% KM (z) UCL	12.55
95% KM (jackknife) UCL	12.47
95% KM (bootstrap t) UCL	14.08
95% KM (BCA) UCL	13.53
95% KM (Percentile Bootstrap) UCL	12.65
95% KM (Chebyshev) UCL	18.61
97.5% KM (Chebyshev) UCL	22.82
99% KM (Chebyshev) UCL	31.09
Potential UCLs to Use	
95% KM (t) UCL	12.78
95% KM (Percentile Bootstrap) UCL	12.65

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHLOROMETHANE

General Statistics

Number of Valid Samples	17	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	15
		Percent Non-Detects	88.24%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	3	Maximum Detected	1.099
Mean of Detected	2	Mean of Detected	0.549
SD of Detected	1.414	SD of Detected	0.777
Minimum Non-Detect	0.9	Minimum Non-Detect	-0.105
Maximum Non-Detect	2	Maximum Non-Detect	0.693

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	16
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	94.12%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.838	Mean	-0.333
SD	0.616	SD	0.526
95% DL/2 (t) UCL	1.099	95% H-Stat (DL/2) UCL	1.155

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.359	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.118
5% K-S Critical Value	N/A	SD	0.471
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.161
		95% KM (t) UCL	1.399
Assuming Gamma Distribution		95% KM (z) UCL	1.383
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.454
Minimum	N/A	95% KM (bootstrap t) UCL	1.8E+308
Maximum	N/A	95% KM (BCA) UCL	3
Mean	N/A	95% KM (Percentile Bootstrap) UCL	3
Median	N/A	95% KM (Chebyshev) UCL	1.821
SD	N/A	97.5% KM (Chebyshev) UCL	2.126
k star	N/A	99% KM (Chebyshev) UCL	2.724
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	1.399
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	3
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

METHYLCYCLOHEXANE

General Statistics

Number of Valid Samples	17	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	14
		Percent Non-Detects	82.35%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	27	Maximum Detected	3.296
Mean of Detected	11	Mean of Detected	1.635
SD of Detected	14	SD of Detected	1.648
Minimum Non-Detect	0.4	Minimum Non-Detect	-0.916
Maximum Non-Detect	1	Maximum Non-Detect	0

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	14
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	82.35%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.862	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.206	Mean	-0.701
SD	6.49	SD	1.303
95% DL/2 (t) UCL	4.954	95% H-Stat (DL/2) UCL	2.361

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-5.817
		SD in Log Scale	4.251
		Mean in Original Scale	1.945
		SD in Original Scale	6.57
		95% Percentile Bootstrap UCL	4.826
		95% BCA Bootstrap UCL	7.003

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.271	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	2.765
5% K-S Critical Value	N/A	SD	6.131
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.821
		95% KM (t) UCL	5.944
Assuming Gamma Distribution		95% KM (z) UCL	5.76
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	5.986
Minimum	N/A	95% KM (bootstrap t) UCL	13.33
Maximum	N/A	95% KM (BCA) UCL	27
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	10.7
SD	N/A	97.5% KM (Chebyshev) UCL	14.14
k star	N/A	99% KM (Chebyshev) UCL	20.89
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	5.944
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DI-N-OCTYL PHTHALATE

General Statistics

Number of Valid Samples	17	Number of Detected Data	5
Number of Unique Samples	5	Number of Non-Detect Data	12
		Percent Non-Detects	70.59%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	26	Minimum Detected	3.258
Maximum Detected	500	Maximum Detected	6.215
Mean of Detected	168.6	Mean of Detected	4.554
SD of Detected	199	SD of Detected	1.199
Minimum Non-Detect	21	Minimum Non-Detect	3.045
Maximum Non-Detect	570	Maximum Non-Detect	6.346

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	17
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.79	Shapiro Wilk Test Statistic	0.933
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	187.9	Mean	4.942
SD	113.4	SD	0.975
95% DL/2 (t) UCL	235.9	95% H-Stat (DL/2) UCL	695.8

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	3.901
		SD in Log Scale	0.976
		Mean in Original Scale	83.38
		SD in Original Scale	118
		95% Percentile Bootstrap UCL	134.8
		95% BCA Bootstrap UCL	158.1

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.536
Theta Star	314.6
nu star	5.359
A-D Test Statistic	0.392
5% A-D Critical Value	0.691
K-S Test Statistic	0.691
5% K-S Critical Value	0.364
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	500
Mean	148
Median	129.4
SD	143.7
k star	0.223
Theta star	662.8
Nu star	7.592
AppChi2	2.501
95% Gamma Approximate UCL	449.3
95% Adjusted Gamma UCL	509.5

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	100.4
SD	123
SE of Mean	43.42
95% KM (t) UCL	176.2
95% KM (z) UCL	171.9
95% KM (jackknife) UCL	175.3
95% KM (bootstrap t) UCL	429.3
95% KM (BCA) UCL	219.5
95% KM (Percentile Bootstrap) UCL	197
95% KM (Chebyshev) UCL	289.7
97.5% KM (Chebyshev) UCL	371.6
99% KM (Chebyshev) UCL	532.5
Potential UCLs to Use	
95% KM (t) UCL	176.2
95% KM (Percentile Bootstrap) UCL	197

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ACENAPHTHENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	7
Number of Unique Samples	7	Number of Non-Detect Data	10
		Percent Non-Detects	58.82%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	21	Minimum Detected	3.045
Maximum Detected	1200	Maximum Detected	7.09
Mean of Detected	415.4	Mean of Detected	5.363
SD of Detected	419.6	SD of Detected	1.462
Minimum Non-Detect	5.8	Minimum Non-Detect	1.758
Maximum Non-Detect	5.9	Maximum Non-Detect	1.775

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	10
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	58.82%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.884	Shapiro Wilk Test Statistic	0.936
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	172.8	Mean	2.843
SD	331.4	SD	2.351
95% DL/2 (t) UCL	313.1	95% H-Stat (DL/2) UCL	2975

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	2.691
		SD in Log Scale	2.711
		Mean in Original Scale	173.9
		SD in Original Scale	330.8
		95% Percentile Bootstrap UCL	310.4
		95% BCA Bootstrap UCL	351

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.598
Theta Star	694.5
nu star	8.374
A-D Test Statistic	0.21
5% A-D Critical Value	0.732
K-S Test Statistic	0.732
5% K-S Critical Value	0.321
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	21
Maximum	1200
Mean	462.8
Median	436.3
SD	286.9
k star	1.507
Theta star	307.1
Nu star	51.24
AppChi2	35.8
95% Gamma Approximate UCL	662.4
95% Adjusted Gamma UCL	688.3

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	183.4
SD	315.9
SE of Mean	82.77
95% KM (t) UCL	327.9
95% KM (z) UCL	319.6
95% KM (jackknife) UCL	311.9
95% KM (bootstrap t) UCL	416.7
95% KM (BCA) UCL	423.5
95% KM (Percentile Bootstrap) UCL	360.6
95% KM (Chebyshev) UCL	544.2
97.5% KM (Chebyshev) UCL	700.3
99% KM (Chebyshev) UCL	1007
Potential UCLs to Use	
95% KM (t) UCL	327.9
95% KM (Percentile Bootstrap) UCL	360.6

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ACENAPHTHYLENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	15
		Percent Non-Detects	88.24%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	80	Minimum Detected	4.382
Maximum Detected	220	Maximum Detected	5.394
Mean of Detected	150	Mean of Detected	4.888
SD of Detected	98.99	SD of Detected	0.715
Minimum Non-Detect	5.9	Minimum Non-Detect	1.775
Maximum Non-Detect	5.9	Maximum Non-Detect	1.775

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	20.25	Mean	1.53
SD	54.75	SD	1.277
95% DL/2 (t) UCL	43.43	95% H-Stat (DL/2) UCL	28.29

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.359	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	88.24
5% K-S Critical Value	N/A	SD	32.94
Data not Gamma Distributed at 5% Significance Level		SE of Mean	11.3
		95% KM (t) UCL	108
Assuming Gamma Distribution		95% KM (z) UCL	106.8
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	181.7
Minimum	N/A	95% KM (bootstrap t) UCL	1.8E+308
Maximum	N/A	95% KM (BCA) UCL	220
Mean	N/A	95% KM (Percentile Bootstrap) UCL	220
Median	N/A	95% KM (Chebyshev) UCL	137.5
SD	N/A	97.5% KM (Chebyshev) UCL	158.8
k star	N/A	99% KM (Chebyshev) UCL	200.7
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	108
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	220
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(A)ANTHRACENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	11
Number of Unique Samples	11	Number of Non-Detect Data	6
		Percent Non-Detects	35.29%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	11	Minimum Detected	2.398
Maximum Detected	390	Maximum Detected	5.966
Mean of Detected	76.27	Mean of Detected	3.773
SD of Detected	109.1	SD of Detected	1.017
Minimum Non-Detect	2.2	Minimum Non-Detect	0.788
Maximum Non-Detect	2.2	Maximum Non-Detect	0.788

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.596	Shapiro Wilk Test Statistic	0.935
5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	49.74	Mean	2.475
SD	93.87	SD	1.982
95% DL/2 (t) UCL	89.49	95% H-Stat (DL/2) UCL	473
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	17.28	Mean in Log Scale	2.845
SD	123.3	SD in Log Scale	1.575
95% MLE (t) UCL	69.48	Mean in Original Scale	50.69
95% MLE (Tiku) UCL	73.73	SD in Original Scale	93.37
		95% Percentile Bootstrap UCL	91.96
		95% BCA Bootstrap UCL	116.4

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.806	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	94.64		
nu star	17.73		
A-D Test Statistic	0.749	**Nonparametric Statistics**	
5% A-D Critical Value	0.751	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.751	Mean	53.24
5% K-S Critical Value	0.262	SD	89.31
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	22.72
		95% KM (t) UCL	92.9
Assuming Gamma Distribution		95% KM (z) UCL	90.6
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	91.42
Minimum	0	95% KM (bootstrap t) UCL	174.5
Maximum	390	95% KM (BCA) UCL	99.88
Mean	56.45	95% KM (Percentile Bootstrap) UCL	94.71
Median	29	95% KM (Chebyshev) UCL	152.3
SD	91.62	97.5% KM (Chebyshev) UCL	195.1
k star	0.218	99% KM (Chebyshev) UCL	279.3
Theta star	259.1		
Nu star	7.408	**Potential UCLs to Use**	
AppChi2	2.397	95% KM (BCA) UCL	99.88
95% Gamma Approximate UCL	174.5		
95% Adjusted Gamma UCL	198.3		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(A)PYRENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	12
Number of Unique Samples	12	Number of Non-Detect Data	5
		Percent Non-Detects	29.41%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	3.8	Minimum Detected	1.335
Maximum Detected	300	Maximum Detected	5.704
Mean of Detected	58.48	Mean of Detected	3.478
SD of Detected	81.92	SD of Detected	1.104
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	1.6	Maximum Non-Detect	0.47

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.616	Shapiro Wilk Test Statistic	0.967
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	41.52	Mean	2.39
SD	73.13	SD	1.965
95% DL/2 (t) UCL	72.48	95% H-Stat (DL/2) UCL	368
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	22.61	Mean in Log Scale	2.686
SD	90.51	SD in Log Scale	1.596
95% MLE (t) UCL	60.93	Mean in Original Scale	42.03
95% MLE (Tiku) UCL	62.43	SD in Original Scale	72.83
		95% Percentile Bootstrap UCL	72.95
		95% BCA Bootstrap UCL	93.61

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.791	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	73.97		
nu star	18.98		
A-D Test Statistic	0.626	**Nonparametric Statistics**	
5% A-D Critical Value	0.757	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.757	Mean	42.4
5% K-S Critical Value	0.253	SD	70.45
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	17.85
		95% KM (t) UCL	73.56
Assuming Gamma Distribution		95% KM (z) UCL	71.76
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	71.29
Minimum	0	95% KM (bootstrap t) UCL	139.1
Maximum	300	95% KM (BCA) UCL	82.18
Mean	43.1	95% KM (Percentile Bootstrap) UCL	74.15
Median	21.7	95% KM (Chebyshev) UCL	120.2
SD	72.39	97.5% KM (Chebyshev) UCL	153.9
k star	0.174	99% KM (Chebyshev) UCL	220
Theta star	248.3		
Nu star	5.901	**Potential UCLs to Use**	
AppChi2	1.589	95% KM (Chebyshev) UCL	120.2
95% Gamma Approximate UCL	160		
95% Adjusted Gamma UCL	185.9		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(B)FLUORANTHENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	15
Number of Unique Samples	15	Number of Non-Detect Data	2
		Percent Non-Detects	11.76%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	4.2	Minimum Detected	1.435
Maximum Detected	570	Maximum Detected	6.346
Mean of Detected	112.6	Mean of Detected	3.899
SD of Detected	158.7	SD of Detected	1.401
Minimum Non-Detect	1.7	Minimum Non-Detect	0.531
Maximum Non-Detect	1.7	Maximum Non-Detect	0.531

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.682	Shapiro Wilk Test Statistic	0.975
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	99.49	Mean	3.421
SD	153	SD	1.88
95% DL/2 (t) UCL	164.3	95% H-Stat (DL/2) UCL	941.7
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	87.51	Mean in Log Scale	3.508
SD	162.2	SD in Log Scale	1.717
95% MLE (t) UCL	156.2	Mean in Original Scale	99.61
95% MLE (Tiku) UCL	152.8	SD in Original Scale	153
		95% Percentile Bootstrap UCL	163.7
		95% BCA Bootstrap UCL	192.8

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.627	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	179.6		
nu star	18.82		
A-D Test Statistic	0.407	**Nonparametric Statistics**	
5% A-D Critical Value	0.777	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.777	Mean	99.88
5% K-S Critical Value	0.231	SD	148.2
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	37.21
		95% KM (t) UCL	164.8
Assuming Gamma Distribution		95% KM (z) UCL	161.1
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	164.5
Minimum	0	95% KM (bootstrap t) UCL	268.1
Maximum	570	95% KM (BCA) UCL	168.2
Mean	99.39	95% KM (Percentile Bootstrap) UCL	163.9
Median	32	95% KM (Chebyshev) UCL	262.1
SD	153.1	97.5% KM (Chebyshev) UCL	332.2
k star	0.207	99% KM (Chebyshev) UCL	470.1
Theta star	479.7		
Nu star	7.045	**Potential UCLs to Use**	
AppChi2	2.195	95% KM (Chebyshev) UCL	262.1
95% Gamma Approximate UCL	319		
95% Adjusted Gamma UCL	364.2		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(G,H,I)PERYLENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	6
Number of Unique Samples	6	Number of Non-Detect Data	11
		Percent Non-Detects	64.71%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	10	Minimum Detected	2.303
Maximum Detected	140	Maximum Detected	4.942
Mean of Detected	62	Mean of Detected	3.778
SD of Detected	51.54	SD of Detected	0.979
Minimum Non-Detect	3.6	Minimum Non-Detect	1.281
Maximum Non-Detect	3.6	Maximum Non-Detect	1.281

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.894	Shapiro Wilk Test Statistic	0.967
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	23.05	Mean	1.714
SD	41.35	SD	1.664
95% DL/2 (t) UCL	40.55	95% H-Stat (DL/2) UCL	61.83

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.536
		SD in Log Scale	2.071
		Mean in Original Scale	23.5
		SD in Original Scale	41.14
		95% Percentile Bootstrap UCL	40.46
		95% BCA Bootstrap UCL	48.59

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.899	**Data appear Normal at 5% Significance Level**	
Theta Star	68.94		
nu star	10.79		
A-D Test Statistic	0.219	**Nonparametric Statistics**	
5% A-D Critical Value	0.707	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.707	Mean	28.35
5% K-S Critical Value	0.337	SD	37.4
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	9.937
		95% KM (t) UCL	45.7
Assuming Gamma Distribution		95% KM (z) UCL	44.7
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	43.38
Minimum	0	95% KM (bootstrap t) UCL	63.49
Maximum	278.9	95% KM (BCA) UCL	68.41
Mean	108.1	95% KM (Percentile Bootstrap) UCL	56
Median	101.6	95% KM (Chebyshev) UCL	71.67
SD	86.71	97.5% KM (Chebyshev) UCL	90.41
k star	0.348	99% KM (Chebyshev) UCL	127.2
Theta star	310.4		
Nu star	11.84	**Potential UCLs to Use**	
AppChi2	5.123	95% KM (t) UCL	45.7
95% Gamma Approximate UCL	249.9	95% KM (Percentile Bootstrap) UCL	56
95% Adjusted Gamma UCL	274.3		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(K)FLUORANTHENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	11
Number of Unique Samples	10	Number of Non-Detect Data	6
		Percent Non-Detects	35.29%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	10	Minimum Detected	2.303
Maximum Detected	370	Maximum Detected	5.914
Mean of Detected	111.7	Mean of Detected	4.145
SD of Detected	126.2	SD of Detected	1.154
Minimum Non-Detect	1.4	Minimum Non-Detect	0.336
Maximum Non-Detect	1.4	Maximum Non-Detect	0.336

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.745	Shapiro Wilk Test Statistic	0.961
5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	72.54	Mean	2.556
SD	113.8	SD	2.398
95% DL/2 (t) UCL	120.7	95% H-Stat (DL/2) UCL	2867
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	33.94	Mean in Log Scale	3.091
SD	151.9	SD in Log Scale	1.789
95% MLE (t) UCL	98.24	Mean in Original Scale	73.72
95% MLE (Tiku) UCL	103.7	SD in Original Scale	113
		95% Percentile Bootstrap UCL	121
		95% BCA Bootstrap UCL	136.8

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.795	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	140.6		
nu star	17.49		
A-D Test Statistic	0.409	**Nonparametric Statistics**	
5% A-D Critical Value	0.751	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.751	Mean	75.82
5% K-S Critical Value	0.262	SD	108.3
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	27.55
		95% KM (t) UCL	123.9
Assuming Gamma Distribution		95% KM (z) UCL	121.1
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	121.3
Minimum	0	95% KM (bootstrap t) UCL	187.1
Maximum	370	95% KM (BCA) UCL	131.7
Mean	83.5	95% KM (Percentile Bootstrap) UCL	125.9
Median	53	95% KM (Chebyshev) UCL	195.9
SD	109.1	97.5% KM (Chebyshev) UCL	247.9
k star	0.218	99% KM (Chebyshev) UCL	350
Theta star	382.4		
Nu star	7.424	**Potential UCLs to Use**	
AppChi2	2.406	95% KM (BCA) UCL	131.7
95% Gamma Approximate UCL	257.6		
95% Adjusted Gamma UCL	292.7		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHRYSENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	13
Number of Unique Samples	13	Number of Non-Detect Data	4
		Percent Non-Detects	23.53%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	4.5	Minimum Detected	1.504
Maximum Detected	680	Maximum Detected	6.522
Mean of Detected	187.7	Mean of Detected	4.452
SD of Detected	198.8	SD of Detected	1.599
Minimum Non-Detect	2.4	Minimum Non-Detect	0.875
Maximum Non-Detect	2.4	Maximum Non-Detect	0.875

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Test Statistic	0.908
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	143.8	Mean	3.447
SD	190.5	SD	2.324
95% DL/2 (t) UCL	224.4	95% H-Stat (DL/2) UCL	6336
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	109.7	Mean in Log Scale	3.593
SD	225.6	SD in Log Scale	2.139
95% MLE (t) UCL	205.2	Mean in Original Scale	144.2
95% MLE (Tiku) UCL	206.8	SD in Original Scale	190.2
		95% Percentile Bootstrap UCL	218.4
		95% BCA Bootstrap UCL	239.7

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.638
Theta Star	294
nu star	16.6
A-D Test Statistic	0.227
5% A-D Critical Value	0.77
K-S Test Statistic	0.77
5% K-S Critical Value	0.246
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	680
Mean	144.4
Median	83
SD	190
k star	0.164
Theta star	880.6
Nu star	5.574
AppChi2	1.426
95% Gamma Approximate UCL	564.2
95% Adjusted Gamma UCL	659.7

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	144.6
SD	184.2
SE of Mean	46.5
95% KM (t) UCL	225.7
95% KM (z) UCL	221
95% KM (jackknife) UCL	224.9
95% KM (bootstrap t) UCL	266.8
95% KM (BCA) UCL	231.6
95% KM (Percentile Bootstrap) UCL	226.2
95% KM (Chebyshev) UCL	347.2
97.5% KM (Chebyshev) UCL	434.9
99% KM (Chebyshev) UCL	607.2
Potential UCLs to Use	
95% KM (Chebyshev) UCL	347.2

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DIBENZO(A,H)ANTHRACENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	4
Number of Unique Samples	4	Number of Non-Detect Data	13
		Percent Non-Detects	76.47%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	19	Minimum Detected	2.944
Maximum Detected	110	Maximum Detected	4.7
Mean of Detected	49.5	Mean of Detected	3.662
SD of Detected	41.72	SD of Detected	0.776
Minimum Non-Detect	4.2	Minimum Non-Detect	1.435
Maximum Non-Detect	4.2	Maximum Non-Detect	1.435

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.827	Shapiro Wilk Test Statistic	0.939
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	13.25	Mean	1.429
SD	27.49	SD	1.32
95% DL/2 (t) UCL	24.89	95% H-Stat (DL/2) UCL	20.43
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	57.99	Mean in Log Scale	0.879
SD	36.13	SD in Log Scale	2.07
95% MLE (t) UCL	73.29	Mean in Original Scale	13.34
95% MLE (Tiku) UCL	88.61	SD in Original Scale	27.54
		95% Percentile Bootstrap UCL	26.03
		95% BCA Bootstrap UCL	30.66

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.726
Theta Star	68.21
nu star	5.805
A-D Test Statistic	0.352
5% A-D Critical Value	0.66
K-S Test Statistic	0.66
5% K-S Critical Value	0.398
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	6.974
Maximum	529.2
Mean	193.7
Median	134.9
SD	171.5
k star	0.879
Theta star	220.3
Nu star	29.89
AppChi2	18.41
95% Gamma Approximate UCL	314.5
95% Adjusted Gamma UCL	N/A

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	26.18
SD	21.78
SE of Mean	6.1
95% KM (t) UCL	36.83
95% KM (z) UCL	36.21
95% KM (jackknife) UCL	34.52
95% KM (bootstrap t) UCL	45.73
95% KM (BCA) UCL	110
95% KM (Percentile Bootstrap) UCL	51.76
95% KM (Chebyshev) UCL	52.77
97.5% KM (Chebyshev) UCL	64.27
99% KM (Chebyshev) UCL	86.88
Potential UCLs to Use	
95% KM (t) UCL	36.83
95% KM (Percentile Bootstrap) UCL	51.76

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

FLUORANTHENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	15
Number of Unique Samples	14	Number of Non-Detect Data	2
		Percent Non-Detects	11.76%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	20	Minimum Detected	2.996
Maximum Detected	1500	Maximum Detected	7.313
Mean of Detected	311.5	Mean of Detected	4.795
SD of Detected	501.4	SD of Detected	1.345
Minimum Non-Detect	2.1	Minimum Non-Detect	0.742
Maximum Non-Detect	2.1	Maximum Non-Detect	0.742

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.597	Shapiro Wilk Test Statistic	0.915
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	275	Mean	4.237
SD	480.2	SD	2.017
95% DL/2 (t) UCL	478.4	95% H-Stat (DL/2) UCL	3106
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	236.2	Mean in Log Scale	4.423
SD	507.9	SD in Log Scale	1.643
95% MLE (t) UCL	451.3	Mean in Original Scale	275.5
95% MLE (Tiku) UCL	439.4	SD in Original Scale	479.9
		95% Percentile Bootstrap UCL	492.3
		95% BCA Bootstrap UCL	557.9

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.561
Theta Star	555.1
nu star	16.84
A-D Test Statistic	1.18
5% A-D Critical Value	0.783
K-S Test Statistic	0.783
5% K-S Critical Value	0.232
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	1500
Mean	274.9
Median	67
SD	480.3
k star	0.199
Theta star	1384
Nu star	6.751
AppChi2	2.035
95% Gamma Approximate UCL	912
95% Adjusted Gamma UCL	1045

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Lognormal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	277.2
SD	464.6
SE of Mean	116.6
95% KM (t) UCL	480.9
95% KM (z) UCL	469.1
95% KM (jackknife) UCL	479.5
95% KM (bootstrap t) UCL	898.5
95% KM (BCA) UCL	484.4
95% KM (Percentile Bootstrap) UCL	471.1
95% KM (Chebyshev) UCL	785.7
97.5% KM (Chebyshev) UCL	1006
99% KM (Chebyshev) UCL	1438
Potential UCLs to Use	
97.5% KM (Chebyshev) UCL	1006

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

INDENO(1,2,3-CD)PYRENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	10
Number of Unique Samples	10	Number of Non-Detect Data	7
		Percent Non-Detects	41.18%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	6.9	Minimum Detected	1.932
Maximum Detected	250	Maximum Detected	5.521
Mean of Detected	97.19	Mean of Detected	4.041
SD of Detected	81.51	SD of Detected	1.281
Minimum Non-Detect	2.5	Minimum Non-Detect	0.916
Maximum Non-Detect	2.5	Maximum Non-Detect	0.916

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Test Statistic	0.89
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	57.69	Mean	2.469
SD	78.14	SD	2.162
95% DL/2 (t) UCL	90.77	95% H-Stat (DL/2) UCL	633.1
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	23.88	Mean in Log Scale	2.703
SD	113.7	SD in Log Scale	1.997
95% MLE (t) UCL	72.01	Mean in Original Scale	58.44
95% MLE (Tiku) UCL	78.56	SD in Original Scale	77.58
		95% Percentile Bootstrap UCL	88.34
		95% BCA Bootstrap UCL	94.31

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.815
Theta Star	119.2
nu star	16.3
A-D Test Statistic	0.374
5% A-D Critical Value	0.747
K-S Test Statistic	0.747
5% K-S Critical Value	0.273
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	250
Mean	79.66
Median	72
SD	70.26
k star	0.338
Theta star	235.5
Nu star	11.5
AppChi2	4.9
95% Gamma Approximate UCL	187
95% Adjusted Gamma UCL	205.6

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	60.01
SD	74.11
SE of Mean	18.95
95% KM (t) UCL	93.09
95% KM (z) UCL	91.17
95% KM (jackknife) UCL	91.32
95% KM (bootstrap t) UCL	101.3
95% KM (BCA) UCL	96.82
95% KM (Percentile Bootstrap) UCL	94.61
95% KM (Chebyshev) UCL	142.6
97.5% KM (Chebyshev) UCL	178.3
99% KM (Chebyshev) UCL	248.5
Potential UCLs to Use	
95% KM (t) UCL	93.09
95% KM (Percentile Bootstrap) UCL	94.61

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NAPHTHALENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	6
Number of Unique Samples	6	Number of Non-Detect Data	11
		Percent Non-Detects	64.71%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	26	Minimum Detected	3.258
Maximum Detected	1100	Maximum Detected	7.003
Mean of Detected	274.5	Mean of Detected	4.785
SD of Detected	413.2	SD of Detected	1.394
Minimum Non-Detect	14	Minimum Non-Detect	2.639
Maximum Non-Detect	14	Maximum Non-Detect	2.639

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.674	Shapiro Wilk Test Statistic	0.95
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	101.4	Mean	2.948
SD	265.9	SD	1.601
95% DL/2 (t) UCL	214	95% H-Stat (DL/2) UCL	180.3
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.477
		SD in Log Scale	3.048
		Mean in Original Scale	98.37
		SD in Original Scale	267.1
		95% Percentile Bootstrap UCL	224.2
		95% BCA Bootstrap UCL	284.4

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.474	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	579.7		
nu star	5.682		
A-D Test Statistic	0.396	**Nonparametric Statistics**	
5% A-D Critical Value	0.722	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.722	Mean	113.7
5% K-S Critical Value	0.344	SD	253.6
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	67.39
		95% KM (t) UCL	231.4
Assuming Gamma Distribution		95% KM (z) UCL	224.5
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	220.8
Minimum	0	95% KM (bootstrap t) UCL	646.3
Maximum	3394	95% KM (BCA) UCL	290.1
Mean	861.8	95% KM (Percentile Bootstrap) UCL	246.8
Median	289.3	95% KM (Chebyshev) UCL	407.4
SD	1058	97.5% KM (Chebyshev) UCL	534.5
k star	0.196	99% KM (Chebyshev) UCL	784.2
Theta star	4389		
Nu star	6.675	**Potential UCLs to Use**	
AppChi2	1.994	95% KM (t) UCL	231.4
95% Gamma Approximate UCL	2885		
95% Adjusted Gamma UCL	3311		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PHENANTHRENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	8
Number of Unique Samples	8	Number of Non-Detect Data	9
		Percent Non-Detects	52.94%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	14	Minimum Detected	2.639
Maximum Detected	550	Maximum Detected	6.31
Mean of Detected	155.6	Mean of Detected	4.313
SD of Detected	195.3	SD of Detected	1.334
Minimum Non-Detect	8.5	Minimum Non-Detect	2.14
Maximum Non-Detect	8.5	Maximum Non-Detect	2.14

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.76	Shapiro Wilk Test Statistic	0.94
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	75.49	Mean	2.796
SD	150.8	SD	1.718
95% DL/2 (t) UCL	139.4	95% H-Stat (DL/2) UCL	273.2

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	2.137
		SD in Log Scale	2.497
		Mean in Original Scale	74.49
		SD in Original Scale	151.4
		95% Percentile Bootstrap UCL	134.2
		95% BCA Bootstrap UCL	160.1

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.588	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	264.8		
nu star	9.405		
A-D Test Statistic	0.402	**Nonparametric Statistics**	
5% A-D Critical Value	0.743	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.743	Mean	80.65
5% K-S Critical Value	0.303	SD	143.9
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	37.31
		95% KM (t) UCL	145.8
Assuming Gamma Distribution		95% KM (z) UCL	142
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	140.5
Minimum	0	95% KM (bootstrap t) UCL	305.7
Maximum	566.3	95% KM (BCA) UCL	154.4
Mean	184.4	95% KM (Percentile Bootstrap) UCL	148.2
Median	100	95% KM (Chebyshev) UCL	243.3
SD	197.2	97.5% KM (Chebyshev) UCL	313.6
k star	0.213	99% KM (Chebyshev) UCL	451.9
Theta star	867		
Nu star	7.229	**Potential UCLs to Use**	
AppChi2	2.297	95% KM (t) UCL	145.8
95% Gamma Approximate UCL	580.2		
95% Adjusted Gamma UCL	660.8		

Note: DL/2 is not a recommended method.

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PYRENE

General Statistics

Number of Valid Samples	17	Number of Detected Data	15
Number of Unique Samples	14	Number of Non-Detect Data	2
		Percent Non-Detects	11.76%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	12	Minimum Detected	2.485
Maximum Detected	810	Maximum Detected	6.697
Mean of Detected	162.1	Mean of Detected	4.293
SD of Detected	253	SD of Detected	1.223
Minimum Non-Detect	4.3	Minimum Non-Detect	1.459
Maximum Non-Detect	4.3	Maximum Non-Detect	1.459

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.587	Shapiro Wilk Test Statistic	0.931
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	143.3	Mean	3.878
SD	242.5	SD	1.638
95% DL/2 (t) UCL	246	95% H-Stat (DL/2) UCL	590.6
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	124	Mean in Log Scale	3.956
SD	256.4	SD in Log Scale	1.492
95% MLE (t) UCL	232.5	Mean in Original Scale	143.6
95% MLE (Tiku) UCL	226.6	SD in Original Scale	242.4
		95% Percentile Bootstrap UCL	246.5
		95% BCA Bootstrap UCL	281.2

Table C.9-2
EPC Calculation Results - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.646
Theta Star	250.8
nu star	19.39
A-D Test Statistic	1.133
5% A-D Critical Value	0.775
K-S Test Statistic	0.775
5% K-S Critical Value	0.23
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	810
Mean	143.1
Median	67
SD	242.7
k star	0.207
Theta star	692.7
Nu star	7.022
AppChi2	2.183
95% Gamma Approximate UCL	460.2
95% Adjusted Gamma UCL	525.6

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Lognormal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	144.5
SD	234.6
SE of Mean	58.9
95% KM (t) UCL	247.3
95% KM (z) UCL	241.4
95% KM (jackknife) UCL	246.4
95% KM (bootstrap t) UCL	542.8
95% KM (BCA) UCL	243.5
95% KM (Percentile Bootstrap) UCL	244.3
95% KM (Chebyshev) UCL	401.2
97.5% KM (Chebyshev) UCL	512.3
99% KM (Chebyshev) UCL	730.5
Potential UCLs to Use	
97.5% KM (Chebyshev) UCL	512.3

Table C.9-3
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ALUMINUM

General Statistics

Number of Valid Samples	51	Number of Unique Samples	49

Raw Statistics		**Log-transformed Statistics**	
Minimum	659	Minimum of Log Data	6.491
Maximum	47500	Maximum of Log Data	10.77
Mean	18223	Mean of log Data	9.637
Median	16000	SD of log Data	0.711
SD	9516		
Coefficient of Variation	0.522		
Skewness	0.991		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.13	Lilliefors Test Statistic	0.203
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	20456	95% H-UCL	24191
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28927
95% Adjusted-CLT UCL	20612	97.5% Chebyshev (MVUE) UCL	32964
95% Modified-t UCL	20487	99% Chebyshev (MVUE) UCL	40894

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.87	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	6350		
nu star	292.7		
Approximate Chi Square Value (.05)	254.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	20415
Adjusted Chi Square Value	253.1	95% Jackknife UCL	20456
		95% Standard Bootstrap UCL	20400
Anderson-Darling Test Statistic	1.047	95% Bootstrap-t UCL	20670
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	20700
Kolmogorov-Smirnov Test Statistic	0.153	95% Percentile Bootstrap UCL	20374
Kolmogorov-Smirnov 5% Critical Value	0.125	95% BCA Bootstrap UCL	20451
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	24031
		97.5% Chebyshev(Mean, Sd) UCL	26544
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	31481
95% Approximate Gamma UCL	20993		
95% Adjusted Gamma UCL	21080		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	24031

Table C.9-3
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	45
Raw Statistics		**Log-transformed Statistics**	
Minimum	4.1	Minimum of Log Data	1.411
Maximum	234	Maximum of Log Data	5.455
Mean	33.84	Mean of log Data	3.331
Median	27.7	SD of log Data	0.575
SD	31.88		
Coefficient of Variation	0.942		
Skewness	5.23		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.311	Lilliefors Test Statistic	0.16
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	41.32	95% H-UCL	38.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	45.16
95% Adjusted-CLT UCL	44.67	97.5% Chebyshev (MVUE) UCL	50.47
95% Modified-t UCL	41.86	99% Chebyshev (MVUE) UCL	60.92
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.633	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	12.85		
nu star	268.6		
Approximate Chi Square Value (.05)	231.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	41.18
Adjusted Chi Square Value	230.6	95% Jackknife UCL	41.32
		95% Standard Bootstrap UCL	41.12
Anderson-Darling Test Statistic	2.733	95% Bootstrap-t UCL	50.63
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	71.8
Kolmogorov-Smirnov Test Statistic	0.209	95% Percentile Bootstrap UCL	42.29
Kolmogorov-Smirnov 5% Critical Value	0.125	95% BCA Bootstrap UCL	46.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	53.3
		97.5% Chebyshev(Mean, Sd) UCL	61.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	78.25
95% Approximate Gamma UCL	39.24		
95% Adjusted Gamma UCL	39.41		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	53.3

Table C.9-3
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	38
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.8	Minimum of Log Data	0.588
Maximum	24.85	Maximum of Log Data	3.213
Mean	7.72	Mean of log Data	1.959
Median	7	SD of log Data	0.42
SD	3.5		
Coefficient of Variation	0.453		
Skewness	2.434		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.151	Lilliefors Test Statistic	0.115
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.541	95% H-UCL	8.629
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.78
95% Adjusted-CLT UCL	8.704	97.5% Chebyshev (MVUE) UCL	10.67
95% Modified-t UCL	8.569	99% Chebyshev (MVUE) UCL	12.41
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.702	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	1.354		
nu star	581.6		
Approximate Chi Square Value (.05)	526.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	8.526
Adjusted Chi Square Value	525.1	95% Jackknife UCL	8.541
		95% Standard Bootstrap UCL	8.511
Anderson-Darling Test Statistic	0.657	95% Bootstrap-t UCL	8.846
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	9.254
Kolmogorov-Smirnov Test Statistic	0.0951	95% Percentile Bootstrap UCL	8.544
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	8.685
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.856
		97.5% Chebyshev(Mean, Sd) UCL	10.78
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.6
95% Approximate Gamma UCL	8.525		
95% Adjusted Gamma UCL	8.549		
Potential UCL to Use		Use 95% Approximate Gamma UCL	8.525

Table C.9-3
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	44
Raw Statistics		**Log-transformed Statistics**	
Minimum	1440	Minimum of Log Data	7.272
Maximum	98100	Maximum of Log Data	11.49
Mean	28215	Mean of log Data	10.1
Median	26800	SD of log Data	0.642
SD	14580		
Coefficient of Variation	0.517		
Skewness	2.44		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.169	Lilliefors Test Statistic	0.216
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	31636	95% H-UCL	35919
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	42517
95% Adjusted-CLT UCL	32318	97.5% Chebyshev (MVUE) UCL	47988
95% Modified-t UCL	31753	99% Chebyshev (MVUE) UCL	58734
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.433	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	8218		
nu star	350.2		
Approximate Chi Square Value (.05)	307.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	31573
Adjusted Chi Square Value	306.7	95% Jackknife UCL	31636
		95% Standard Bootstrap UCL	31638
Anderson-Darling Test Statistic	2.462	95% Bootstrap-t UCL	32723
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	34559
Kolmogorov-Smirnov Test Statistic	0.171	95% Percentile Bootstrap UCL	31666
Kolmogorov-Smirnov 5% Critical Value	0.125	95% BCA Bootstrap UCL	32437
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	37114
		97.5% Chebyshev(Mean, Sd) UCL	40965
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	48529
95% Approximate Gamma UCL	32098		
95% Adjusted Gamma UCL	32218		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	37114

Table C.9-3
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	48
Raw Statistics		**Log-transformed Statistics**	
Minimum	2.4	Minimum of Log Data	0.875
Maximum	1100	Maximum of Log Data	7.003
Mean	54.82	Mean of log Data	3.13
Median	19.4	SD of log Data	1.075
SD	155.5		
Coefficient of Variation	2.836		
Skewness	6.363		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.368	Lilliefors Test Statistic	0.154
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	91.31	95% H-UCL	58.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	71.6
95% Adjusted-CLT UCL	111.4	97.5% Chebyshev (MVUE) UCL	85.24
95% Modified-t UCL	94.54	99% Chebyshev (MVUE) UCL	112
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.665	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	82.43		
nu star	67.83		
Approximate Chi Square Value (.05)	49.87	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	90.63
Adjusted Chi Square Value	49.42	95% Jackknife UCL	91.31
		95% Standard Bootstrap UCL	90.39
Anderson-Darling Test Statistic	4.364	95% Bootstrap-t UCL	210.1
Anderson-Darling 5% Critical Value	0.798	95% Hall's Bootstrap UCL	216
Kolmogorov-Smirnov Test Statistic	0.242	95% Percentile Bootstrap UCL	94.55
Kolmogorov-Smirnov 5% Critical Value	0.13	95% BCA Bootstrap UCL	134.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	149.7
		97.5% Chebyshev(Mean, Sd) UCL	190.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	271.4
95% Approximate Gamma UCL	74.55		
95% Adjusted Gamma UCL	75.23		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	190.8

Table C.9-3
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	49
Raw Statistics		**Log-transformed Statistics**	
Minimum	10.7	Minimum of Log Data	2.37
Maximum	952	Maximum of Log Data	6.859
Mean	364.6	Mean of log Data	5.726
Median	325	SD of log Data	0.732
SD	183.2		
Coefficient of Variation	0.502		
Skewness	0.989		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.0954	Lilliefors Test Statistic	0.199
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	407.6	95% H-UCL	495.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	594.5
95% Adjusted-CLT UCL	410.6	97.5% Chebyshev (MVUE) UCL	679.5
95% Modified-t UCL	408.2	99% Chebyshev (MVUE) UCL	846.3
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.879	**Data appear Normal at 5% Significance Level**	
Theta Star	126.6		
nu star	293.7		
Approximate Chi Square Value (.05)	255	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	406.8
Adjusted Chi Square Value	253.9	95% Jackknife UCL	407.6
		95% Standard Bootstrap UCL	406.8
Anderson-Darling Test Statistic	1.073	95% Bootstrap-t UCL	413.6
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	415.5
Kolmogorov-Smirnov Test Statistic	0.148	95% Percentile Bootstrap UCL	408.6
Kolmogorov-Smirnov 5% Critical Value	0.125	95% BCA Bootstrap UCL	408.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	476.4
		97.5% Chebyshev(Mean, Sd) UCL	524.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	619.8
95% Approximate Gamma UCL	419.9		
95% Adjusted Gamma UCL	421.7		
Potential UCL to Use		Use 95% Student's-t UCL	407.6

Table C.9-3
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

VANADIUM

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	49
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.4	Minimum of Log Data	1.686
Maximum	95.2	Maximum of Log Data	4.556
Mean	44	Mean of log Data	3.661
Median	45	SD of log Data	0.575
SD	18.37		
Coefficient of Variation	0.417		
Skewness	0.176		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.0784	Lilliefors Test Statistic	0.168
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	48.31	95% H-UCL	53.68
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	62.83
95% Adjusted-CLT UCL	48.3	97.5% Chebyshev (MVUE) UCL	70.22
95% Modified-t UCL	48.32	99% Chebyshev (MVUE) UCL	84.76
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.989	**Data appear Normal at 5% Significance Level**	
Theta Star	11.03		
nu star	406.9		
Approximate Chi Square Value (.05)	361.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	48.23
Adjusted Chi Square Value	359.9	95% Jackknife UCL	48.31
		95% Standard Bootstrap UCL	48.15
Anderson-Darling Test Statistic	1.563	95% Bootstrap-t UCL	48.3
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	48.39
Kolmogorov-Smirnov Test Statistic	0.128	95% Percentile Bootstrap UCL	48.03
Kolmogorov-Smirnov 5% Critical Value	0.125	95% BCA Bootstrap UCL	48.26
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	55.21
		97.5% Chebyshev(Mean, Sd) UCL	60.06
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	69.59
95% Approximate Gamma UCL	49.57		
95% Adjusted Gamma UCL	49.74		
Potential UCL to Use		Use 95% Student's-t UCL	48.31

Table C.9-3
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ZINC

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	51
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.5	Minimum of Log Data	1.705
Maximum	16000	Maximum of Log Data	9.68
Mean	389.8	Mean of log Data	4.109
Median	47.5	SD of log Data	1.101
SD	2232		
Coefficient of Variation	5.726		
Skewness	7.118		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.485	Lilliefors Test Statistic	0.17
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	913.6	95% H-UCL	162.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	198.4
95% Adjusted-CLT UCL	1237	97.5% Chebyshev (MVUE) UCL	236.9
95% Modified-t UCL	965.5	99% Chebyshev (MVUE) UCL	312.4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.352	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	1106		
nu star	35.94		
Approximate Chi Square Value (.05)	23.22	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	903.9
Adjusted Chi Square Value	22.92	95% Jackknife UCL	913.6
		95% Standard Bootstrap UCL	905
Anderson-Darling Test Statistic	11.9	95% Bootstrap-t UCL	17449
Anderson-Darling 5% Critical Value	0.848	95% Hall's Bootstrap UCL	6776
Kolmogorov-Smirnov Test Statistic	0.381	95% Percentile Bootstrap UCL	1009
Kolmogorov-Smirnov 5% Critical Value	0.134	95% BCA Bootstrap UCL	1339
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1752
		97.5% Chebyshev(Mean, Sd) UCL	2342
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3500
95% Approximate Gamma UCL	603.3		
95% Adjusted Gamma UCL	611.2		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	2342

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ANTIMONY

General Statistics

Number of Valid Samples	47	Number of Detected Data	35
Number of Unique Samples	27	Number of Non-Detect Data	12
		Percent Non-Detects	25.53%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.31	Minimum Detected	-1.171
Maximum Detected	6.1	Maximum Detected	1.808
Mean of Detected	1.006	Mean of Detected	-0.291
SD of Detected	1.17	SD of Detected	0.656
Minimum Non-Detect	0.17	Minimum Non-Detect	-1.772
Maximum Non-Detect	0.59	Maximum Non-Detect	-0.528

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	31
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	16
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	65.96%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.524	Shapiro Wilk Test Statistic	0.817
5% Shapiro Wilk Critical Value	0.934	5% Shapiro Wilk Critical Value	0.934
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.807	Mean	-0.607
SD	1.063	SD	0.799
95% DL/2 (t) UCL	1.067	95% H-Stat (DL/2) UCL	0.935

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.575
		SD in Log Scale	0.761
		Mean in Original Scale	0.815
		SD in Original Scale	1.059
		95% Percentile Bootstrap UCL	1.076
		95% BCA Bootstrap UCL	1.175

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.695
Theta Star	0.594
nu star	118.7
A-D Test Statistic	3.604
5% A-D Critical Value	0.762
K-S Test Statistic	0.762
5% K-S Critical Value	0.151
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	6.1
Mean	0.84
Median	0.54
SD	1.056
k star	0.526
Theta star	1.596
Nu star	49.46
AppChi2	34.32
95% Gamma Approximate UCL	1.21
95% Adjusted Gamma UCL	1.225

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.843
SD	1.033
SE of Mean	0.153
95% KM (t) UCL	1.1
95% KM (z) UCL	1.095
95% KM (jackknife) UCL	1.094
95% KM (bootstrap t) UCL	1.47
95% KM (BCA) UCL	1.129
95% KM (Percentile Bootstrap) UCL	1.122
95% KM (Chebyshev) UCL	1.511
97.5% KM (Chebyshev) UCL	1.799
99% KM (Chebyshev) UCL	2.366
Potential UCLs to Use	
95% KM (BCA) UCL	1.129

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC

General Statistics

Number of Valid Samples	51	Number of Detected Data	50
Number of Unique Samples	38	Number of Non-Detect Data	1
		Percent Non-Detects	1.96%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.3	Minimum Detected	0.262
Maximum Detected	74.6	Maximum Detected	4.312
Mean of Detected	10.72	Mean of Detected	1.799
SD of Detected	16.55	SD of Detected	0.918
Minimum Non-Detect	0.27	Minimum Non-Detect	-1.309
Maximum Non-Detect	0.27	Maximum Non-Detect	-1.309

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.525	Lilliefors Test Statistic	0.861
5% Lilliefors Critical Value	0.947	5% Lilliefors Critical Value	0.947
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	10.51	Mean	1.724
SD	16.45	SD	1.053
95% DL/2 (t) UCL	14.37	95% H-Stat (DL/2) UCL	13.19
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	10.32	Mean in Log Scale	1.755
SD	16.51	SD in Log Scale	0.962
95% MLE (t) UCL	14.19	Mean in Original Scale	10.52
95% MLE (Tiku) UCL	13.84	SD in Original Scale	16.44
		95% Percentile Bootstrap UCL	14.36
		95% BCA Bootstrap UCL	15.51

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.959
Theta Star	11.17
nu star	95.94
A-D Test Statistic	5.025
5% A-D Critical Value	0.78
K-S Test Statistic	0.78
5% K-S Critical Value	0.129
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	74.6
Mean	10.51
Median	5
SD	16.45
k star	0.595
Theta star	17.66
Nu star	60.69
AppChi2	43.78
95% Gamma Approximate UCL	14.57
95% Adjusted Gamma UCL	14.71

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	10.53
SD	16.27
SE of Mean	2.302
95% KM (t) UCL	14.39
95% KM (z) UCL	14.32
95% KM (jackknife) UCL	14.38
95% KM (bootstrap t) UCL	16.43
95% KM (BCA) UCL	14.39
95% KM (Percentile Bootstrap) UCL	14.47
95% KM (Chebyshev) UCL	20.57
97.5% KM (Chebyshev) UCL	24.91
99% KM (Chebyshev) UCL	33.44
Potential UCLs to Use	
95% KM (Chebyshev) UCL	20.57

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CADMIUM

General Statistics

Number of Valid Samples	51	Number of Detected Data	31
Number of Unique Samples	25	Number of Non-Detect Data	20
		Percent Non-Detects	39.22%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.08	Minimum Detected	-2.526
Maximum Detected	7.6	Maximum Detected	2.028
Mean of Detected	0.76	Mean of Detected	-0.966
SD of Detected	1.4	SD of Detected	1.056
Minimum Non-Detect	0.03	Minimum Non-Detect	-3.507
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	20
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	31
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	39.22%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.471	Lilliefors Test Statistic	0.942
5% Lilliefors Critical Value	0.929	5% Lilliefors Critical Value	0.929
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.47	Mean	-2.105
SD	1.144	SD	1.653
95% DL/2 (t) UCL	0.739	95% H-Stat (DL/2) UCL	0.549

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.003
		SD in Log Scale	1.601
		Mean in Original Scale	0.475
		SD in Original Scale	1.142
		95% Percentile Bootstrap UCL	0.767
		95% BCA Bootstrap UCL	0.918

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.79
Theta Star	0.961
nu star	49.01
A-D Test Statistic	1.85
5% A-D Critical Value	0.783
K-S Test Statistic	0.783
5% K-S Critical Value	0.163
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	7.6
Mean	0.577
Median	0.3
SD	1.128
k star	0.222
Theta star	2.603
Nu star	22.63
AppChi2	12.81
95% Gamma Approximate UCL	1.02
95% Adjusted Gamma UCL	1.038

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Lognormal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.493
SD	1.124
SE of Mean	0.16
95% KM (t) UCL	0.761
95% KM (z) UCL	0.756
95% KM (jackknife) UCL	0.756
95% KM (bootstrap t) UCL	1.262
95% KM (BCA) UCL	0.8
95% KM (Percentile Bootstrap) UCL	0.769
95% KM (Chebyshev) UCL	1.191
97.5% KM (Chebyshev) UCL	1.492
99% KM (Chebyshev) UCL	2.085
Potential UCLs to Use	
95% KM (Chebyshev) UCL	1.191

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COPPER

General Statistics

Number of Valid Samples	50	Number of Detected Data	49
Number of Unique Samples	48	Number of Non-Detect Data	1
		Percent Non-Detects	2.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.1	Minimum Detected	0.742
Maximum Detected	52000	Maximum Detected	10.86
Mean of Detected	1098	Mean of Detected	3.158
SD of Detected	7424	SD of Detected	1.518
Minimum Non-Detect	0.16	Minimum Non-Detect	-1.833
Maximum Non-Detect	0.16	Maximum Non-Detect	-1.833

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.149	Shapiro Wilk Test Statistic	0.79
5% Shapiro Wilk Critical Value	0.947	5% Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1076	Mean	3.044
SD	7349	SD	1.704
95% DL/2 (t) UCL	2818	95% H-Stat (DL/2) UCL	174.7
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	964.9	Mean in Log Scale	3.089
SD	7357	SD in Log Scale	1.579
95% MLE (t) UCL	2709	Mean in Original Scale	1076
95% MLE (Tiku) UCL	2498	SD in Original Scale	7349
		95% Percentile Bootstrap UCL	3152
		95% BCA Bootstrap UCL	4214

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.194
Theta Star	5644
nu star	19.06
A-D Test Statistic	13.61
5% A-D Critical Value	0.912
K-S Test Statistic	0.912
5% K-S Critical Value	0.141
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	52000
Mean	1076
Median	20.65
SD	7349
k star	0.178
Theta star	6057
Nu star	17.76
AppChi2	9.216
95% Gamma Approximate UCL	2072
95% Adjusted Gamma UCL	2115

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	1076
SD	7275
SE of Mean	1040
95% KM (t) UCL	2818
95% KM (z) UCL	2786
95% KM (jackknife) UCL	2818
95% KM (bootstrap t) UCL	347385
95% KM (BCA) UCL	3149
95% KM (Percentile Bootstrap) UCL	3152
95% KM (Chebyshev) UCL	5607
97.5% KM (Chebyshev) UCL	7568
99% KM (Chebyshev) UCL	11419
Potential UCLs to Use	
97.5% KM (Chebyshev) UCL	7568

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MERCURY

General Statistics

Number of Valid Samples	51	Number of Detected Data	45
Number of Unique Samples	40	Number of Non-Detect Data	6
		Percent Non-Detects	11.76%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.026	Minimum Detected	-3.65
Maximum Detected	11	Maximum Detected	2.398
Mean of Detected	0.673	Mean of Detected	-1.685
SD of Detected	1.742	SD of Detected	1.421
Minimum Non-Detect	0.019	Minimum Non-Detect	-3.963
Maximum Non-Detect	0.025	Maximum Non-Detect	-3.689

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	6
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	45
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	11.76%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.4	Lilliefors Test Statistic	0.905
5% Lilliefors Critical Value	0.945	5% Lilliefors Critical Value	0.945
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.596	Mean	-2.015
SD	1.648	SD	1.616
95% DL/2 (t) UCL	0.982	95% H-Stat (DL/2) UCL	0.866
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.448	Mean in Log Scale	-2.055
SD	1.764	SD in Log Scale	1.682
95% MLE (t) UCL	0.862	Mean in Original Scale	0.595
95% MLE (Tiku) UCL	0.833	SD in Original Scale	1.648
		95% Percentile Bootstrap UCL	1.009
		95% BCA Bootstrap UCL	1.307

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.475
Theta Star	1.417
nu star	42.79
A-D Test Statistic	3.908
5% A-D Critical Value	0.815
K-S Test Statistic	0.815
5% K-S Critical Value	0.139
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	11
Mean	0.594
Median	0.096
SD	1.648
k star	0.214
Theta star	2.772
Nu star	21.87
AppChi2	12.24
95% Gamma Approximate UCL	1.062
95% Adjusted Gamma UCL	1.08

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.597
SD	1.631
SE of Mean	0.231
95% KM (t) UCL	0.984
95% KM (z) UCL	0.977
95% KM (jackknife) UCL	0.983
95% KM (bootstrap t) UCL	1.617
95% KM (BCA) UCL	1.06
95% KM (Percentile Bootstrap) UCL	1.018
95% KM (Chebyshev) UCL	1.604
97.5% KM (Chebyshev) UCL	2.04
99% KM (Chebyshev) UCL	2.895
Potential UCLs to Use	
95% KM (Chebyshev) UCL	1.604

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

THALLIUM

General Statistics

Number of Valid Samples	32	Number of Detected Data	7
Number of Unique Samples	7	Number of Non-Detect Data	25
		Percent Non-Detects	78.13%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.26	Minimum Detected	-1.347
Maximum Detected	1.3	Maximum Detected	0.262
Mean of Detected	0.556	Mean of Detected	-0.754
SD of Detected	0.38	SD of Detected	0.596
Minimum Non-Detect	0.26	Minimum Non-Detect	-1.347
Maximum Non-Detect	0.81	Maximum Non-Detect	-0.211

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	30
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	93.75%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.808	Shapiro Wilk Test Statistic	0.909
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.312	Mean	-1.332
SD	0.229	SD	0.552
95% DL/2 (t) UCL	0.381	95% H-Stat (DL/2) UCL	0.417

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.532
		SD in Log Scale	0.566
		Mean in Original Scale	0.264
		SD in Original Scale	0.235
		95% Percentile Bootstrap UCL	0.332
		95% BCA Bootstrap UCL	0.365

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.903
Theta Star	0.292
nu star	26.65
A-D Test Statistic	0.443
5% A-D Critical Value	0.712
K-S Test Statistic	0.712
5% K-S Critical Value	0.314
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.26
Maximum	1.3
Mean	0.573
Median	0.583
SD	0.185
k star	10.03
Theta star	0.0571
Nu star	641.8
AppChi2	584
95% Gamma Approximate UCL	0.629
95% Adjusted Gamma UCL	0.632

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.337
SD	0.205
SE of Mean	0.0406
95% KM (t) UCL	0.406
95% KM (z) UCL	0.404
95% KM (jackknife) UCL	0.398
95% KM (bootstrap t) UCL	0.461
95% KM (BCA) UCL	0.511
95% KM (Percentile Bootstrap) UCL	0.45
95% KM (Chebyshev) UCL	0.514
97.5% KM (Chebyshev) UCL	0.591
99% KM (Chebyshev) UCL	0.741
Potential UCLs to Use	
95% KM (t) UCL	0.406
95% KM (Percentile Bootstrap) UCL	0.45

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

4-METHYL-2-PENTANONE

General Statistics

Number of Valid Samples	45	Number of Detected Data	20
Number of Unique Samples	16	Number of Non-Detect Data	25
		Percent Non-Detects	55.56%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	3	Minimum Detected	1.099
Maximum Detected	31	Maximum Detected	3.434
Mean of Detected	13.28	Mean of Detected	2.344
SD of Detected	8.921	SD of Detected	0.742
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	4	Maximum Non-Detect	1.386

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	26
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	19
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	57.78%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.896	Shapiro Wilk Test Statistic	0.934
5% Shapiro Wilk Critical Value	0.905	5% Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.148	Mean	0.523
SD	8.721	SD	1.744
95% DL/2 (t) UCL	8.333	95% H-Stat (DL/2) UCL	12.75
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.936	Mean in Log Scale	1.201
SD	14.15	SD in Log Scale	1.218
95% MLE (t) UCL	4.481	Mean in Original Scale	6.756
95% MLE (Tiku) UCL	5.777	SD in Original Scale	8.339
		95% Percentile Bootstrap UCL	8.77
		95% BCA Bootstrap UCL	9.307

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.914
Theta Star	6.938
nu star	76.58
A-D Test Statistic	0.523
5% A-D Critical Value	0.751
K-S Test Statistic	0.751
5% K-S Critical Value	0.196
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	3
Maximum	31
Mean	13.24
Median	13.03
SD	5.873
k star	4.477
Theta star	2.958
Nu star	403
AppChi2	357.4
95% Gamma Approximate UCL	14.93
95% Adjusted Gamma UCL	14.99

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	7.569
SD	7.727
SE of Mean	1.182
95% KM (t) UCL	9.555
95% KM (z) UCL	9.513
95% KM (jackknife) UCL	9.256
95% KM (bootstrap t) UCL	9.736
95% KM (BCA) UCL	10.21
95% KM (Percentile Bootstrap) UCL	9.822
95% KM (Chebyshev) UCL	12.72
97.5% KM (Chebyshev) UCL	14.95
99% KM (Chebyshev) UCL	19.33
Potential UCLs to Use	
95% KM (t) UCL	9.555

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHLOROMETHANE

General Statistics

Number of Valid Samples	45	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	42
		Percent Non-Detects	93.33%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	3	Maximum Detected	1.099
Mean of Detected	2	Mean of Detected	0.597
SD of Detected	1	SD of Detected	0.556
Minimum Non-Detect	0.9	Minimum Non-Detect	-0.105
Maximum Non-Detect	2	Maximum Non-Detect	0.693

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	43
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	95.56%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	0.978
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.781	Mean	-0.362
SD	0.464	SD	0.45
95% DL/2 (t) UCL	0.897	95% H-Stat (DL/2) UCL	0.881

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-2.575
		SD in Log Scale	1.541
		Mean in Original Scale	0.251
		SD in Original Scale	0.539
		95% Percentile Bootstrap UCL	0.394
		95% BCA Bootstrap UCL	0.441

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.26	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.067
5% K-S Critical Value	N/A	SD	0.327
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0596
		95% KM (t) UCL	1.167
Assuming Gamma Distribution		95% KM (z) UCL	1.165
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.706
Minimum	N/A	95% KM (bootstrap t) UCL	1.105
Maximum	N/A	95% KM (BCA) UCL	3
Mean	N/A	95% KM (Percentile Bootstrap) UCL	3
Median	N/A	95% KM (Chebyshev) UCL	1.327
SD	N/A	97.5% KM (Chebyshev) UCL	1.439
k star	N/A	99% KM (Chebyshev) UCL	1.66
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	1.167
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	3
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CYCLOHEXANE

General Statistics

Number of Valid Samples	45	Number of Detected Data	4
Number of Unique Samples	3	Number of Non-Detect Data	41
		Percent Non-Detects	91.11%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.175	Minimum Detected	0.161
Maximum Detected	145	Maximum Detected	4.977
Mean of Detected	38.04	Mean of Detected	1.834
SD of Detected	71.31	SD of Detected	2.141
Minimum Non-Detect	0.4	Minimum Non-Detect	-0.916
Maximum Non-Detect	2	Maximum Non-Detect	0.693

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	42
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	93.33%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.64	Shapiro Wilk Test Statistic	0.796
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.703	Mean	-0.848
SD	21.55	SD	1.07
95% DL/2 (t) UCL	9.1	95% H-Stat (DL/2) UCL	0.901

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-9.375
		SD in Log Scale	5.313
		Mean in Original Scale	3.384
		SD in Original Scale	21.6
		95% Percentile Bootstrap UCL	9.801
		95% BCA Bootstrap UCL	13.18

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.259
Theta Star	146.9
nu star	2.072
A-D Test Statistic	0.727
5% A-D Critical Value	0.696
K-S Test Statistic	0.696
5% K-S Critical Value	0.415
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	496.7
Mean	98.85
Median	34.84
SD	134.9
k star	0.107
Theta star	920.3
Nu star	9.667
AppChi2	3.735
95% Gamma Approximate UCL	255.9
95% Adjusted Gamma UCL	N/A

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Lognormal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	4.452
SD	21.19
SE of Mean	3.648
95% KM (t) UCL	10.58
95% KM (z) UCL	10.45
95% KM (jackknife) UCL	8.898
95% KM (bootstrap t) UCL	190.4
95% KM (BCA) UCL	N/A
95% KM (Percentile Bootstrap) UCL	145
95% KM (Chebyshev) UCL	20.35
97.5% KM (Chebyshev) UCL	27.23
99% KM (Chebyshev) UCL	40.75
Potential UCLs to Use	
99% KM (Chebyshev) UCL	40.75

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

METHYLCYCLOHEXANE

General Statistics

Number of Valid Samples	45	Number of Detected Data	10
Number of Unique Samples	9	Number of Non-Detect Data	35
		Percent Non-Detects	77.78%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.535	Minimum Detected	-0.625
Maximum Detected	410	Maximum Detected	6.016
Mean of Detected	45.19	Mean of Detected	1.2
SD of Detected	128.4	SD of Detected	2.059
Minimum Non-Detect	0.4	Minimum Non-Detect	-0.916
Maximum Non-Detect	2	Maximum Non-Detect	0.693

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	39
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	6
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	86.67%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.404	Shapiro Wilk Test Statistic	0.824
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	10.32	Mean	-0.608
SD	61.07	SD	1.393
95% DL/2 (t) UCL	25.61	95% H-Stat (DL/2) UCL	1.994

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.183
		SD in Log Scale	3.672
		Mean in Original Scale	10.06
		SD in Original Scale	61.11
		95% Percentile Bootstrap UCL	28.09
		95% BCA Bootstrap UCL	45.82

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.255
Theta Star	177.3
nu star	5.098
A-D Test Statistic	1.666
5% A-D Critical Value	0.826
K-S Test Statistic	0.826
5% K-S Critical Value	0.29
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	410
Mean	41.03
Median	36.22
SD	62.17
k star	0.163
Theta star	251.5
Nu star	14.68
AppChi2	7.042
95% Gamma Approximate UCL	85.56
95% Adjusted Gamma UCL	87.75

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	10.46
SD	60.36
SE of Mean	9.485
95% KM (t) UCL	26.4
95% KM (z) UCL	26.06
95% KM (jackknife) UCL	25.72
95% KM (bootstrap t) UCL	854.9
95% KM (BCA) UCL	29.15
95% KM (Percentile Bootstrap) UCL	28.57
95% KM (Chebyshev) UCL	51.81
97.5% KM (Chebyshev) UCL	69.7
99% KM (Chebyshev) UCL	104.8
Potential UCLs to Use	
99% KM (Chebyshev) UCL	104.8

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DI-N-OCTYL PHTHALATE

General Statistics

Number of Valid Samples	45	Number of Detected Data	10
Number of Unique Samples	10	Number of Non-Detect Data	35
		Percent Non-Detects	77.78%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	26	Minimum Detected	3.258
Maximum Detected	1145	Maximum Detected	7.043
Mean of Detected	268.9	Mean of Detected	4.901
SD of Detected	349.6	SD of Detected	1.244
Minimum Non-Detect	21	Minimum Non-Detect	3.045
Maximum Non-Detect	600	Maximum Non-Detect	6.397

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	44
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.78%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.725	Shapiro Wilk Test Statistic	0.931
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	214.4	Mean	5.018
SD	173.4	SD	1.039
95% DL/2 (t) UCL	257.8	95% H-Stat (DL/2) UCL	452.4

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	3.76
		SD in Log Scale	1.098
		Mean in Original Scale	91.87
		SD in Original Scale	186.8
		95% Percentile Bootstrap UCL	142.1
		95% BCA Bootstrap UCL	171

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.661
Theta Star	406.9
nu star	13.22
A-D Test Statistic	0.527
5% A-D Critical Value	0.754
K-S Test Statistic	0.754
5% K-S Critical Value	0.275
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	1145
Mean	276.6
Median	210
SD	259.2
k star	0.224
Theta star	1234
Nu star	20.18
AppChi2	10.98
95% Gamma Approximate UCL	508.1
95% Adjusted Gamma UCL	518.8

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only		
Data appear Gamma Distributed at 5% Significance Level		
	Nonparametric Statistics	
	Kaplan-Meier (KM) Method	
	Mean	112.8
	SD	189.5
	SE of Mean	34.36
	95% KM (t) UCL	170.5
	95% KM (z) UCL	169.3
	95% KM (jackknife) UCL	164.9
	95% KM (bootstrap t) UCL	198.4
	95% KM (BCA) UCL	189.6
	95% KM (Percentile Bootstrap) UCL	176.3
	95% KM (Chebyshev) UCL	262.6
	97.5% KM (Chebyshev) UCL	327.4
	99% KM (Chebyshev) UCL	454.7
	Potential UCLs to Use	
	95% KM (t) UCL	170.5

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR-1242

General Statistics

Number of Valid Samples	57	Number of Detected Data	7
Number of Unique Samples	6	Number of Non-Detect Data	50
		Percent Non-Detects	87.72%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	9	Minimum Detected	2.197
Maximum Detected	17000	Maximum Detected	9.741
Mean of Detected	2437	Mean of Detected	3.309
SD of Detected	6422	SD of Detected	2.836
Minimum Non-Detect	7.2	Minimum Non-Detect	1.974
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	56
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	98.25%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.453	Lilliefors Test Statistic	0.461
5% Lilliefors Critical Value	0.803	5% Lilliefors Critical Value	0.803
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	303.5	Mean	1.794
SD	2251	SD	1.093
95% DL/2 (t) UCL	802.2	95% H-Stat (DL/2) UCL	15.59

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	0.479
		SD in Log Scale	2.891
		Mean in Original Scale	316.2
		SD in Original Scale	2250
		95% Percentile Bootstrap UCL	908.6
		95% BCA Bootstrap UCL	1214

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.191
Theta Star	12729
nu star	2.68
A-D Test Statistic	2.08
5% A-D Critical Value	0.833
K-S Test Statistic	0.833
5% K-S Critical Value	0.344
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	17000
Mean	1598
Median	1299
SD	2455
k star	0.0893
Theta star	17900
Nu star	10.18
AppChi2	4.052
95% Gamma Approximate UCL	4013
95% Adjusted Gamma UCL	4114

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	307.3
SD	2231
SE of Mean	319.1
95% KM (t) UCL	841
95% KM (z) UCL	832.2
95% KM (jackknife) UCL	805.7
95% KM (bootstrap t) UCL	2607657
95% KM (BCA) UCL	903.7
95% KM (Percentile Bootstrap) UCL	903.5
95% KM (Chebyshev) UCL	1698
97.5% KM (Chebyshev) UCL	2300
99% KM (Chebyshev) UCL	3483
Potential UCLs to Use	
99% KM (Chebyshev) UCL	3483

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR-1254

General Statistics

Number of Valid Samples	57	Number of Detected Data	38
Number of Unique Samples	34	Number of Non-Detect Data	19
		Percent Non-Detects	33.33%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	20	Minimum Detected	2.996
Maximum Detected	5000	Maximum Detected	8.517
Mean of Detected	549.8	Mean of Detected	5.254
SD of Detected	1033	SD of Detected	1.421
Minimum Non-Detect	9	Minimum Non-Detect	2.197
Maximum Non-Detect	9	Maximum Non-Detect	2.197

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.539	Lilliefors Test Statistic	0.961
5% Lilliefors Critical Value	0.938	5% Lilliefors Critical Value	0.938
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	368	Mean	4.004
SD	878.6	SD	2.125
95% DL/2 (t) UCL	562.7	95% H-Stat (DL/2) UCL	1043
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	74.6	Mean in Log Scale	4.087
SD	1138	SD in Log Scale	2.107
95% MLE (t) UCL	326.7	Mean in Original Scale	369.3
95% MLE (Tiku) UCL	343.2	SD in Original Scale	878.1
		95% Percentile Bootstrap UCL	577
		95% BCA Bootstrap UCL	622.1

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.558
Theta Star	984.5
nu star	42.44
A-D Test Statistic	1.753
5% A-D Critical Value	0.804
K-S Test Statistic	0.804
5% K-S Critical Value	0.15
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	5000
Mean	383.5
Median	90
SD	874
k star	0.125
Theta star	3080
Nu star	14.2
AppChi2	6.706
95% Gamma Approximate UCL	811.9
95% Adjusted Gamma UCL	828.5

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Lognormal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	373.2
SD	868.8
SE of Mean	116.6
95% KM (t) UCL	568.2
95% KM (z) UCL	565
95% KM (jackknife) UCL	566.7
95% KM (bootstrap t) UCL	724.2
95% KM (BCA) UCL	596
95% KM (Percentile Bootstrap) UCL	581.9
95% KM (Chebyshev) UCL	881.5
97.5% KM (Chebyshev) UCL	1101
99% KM (Chebyshev) UCL	1533
Potential UCLs to Use	
95% KM (Chebyshev) UCL	881.5

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR-1260

General Statistics

Number of Valid Samples	57	Number of Detected Data	17
Number of Unique Samples	16	Number of Non-Detect Data	40
		Percent Non-Detects	70.18%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	18	Minimum Detected	2.89
Maximum Detected	660	Maximum Detected	6.492
Mean of Detected	164.5	Mean of Detected	4.648
SD of Detected	168.9	SD of Detected	1.014
Minimum Non-Detect	5.4	Minimum Non-Detect	1.686
Maximum Non-Detect	21	Maximum Non-Detect	3.045

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	41
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	16
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	71.93%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.784	Lilliefors Test Statistic	0.977
5% Lilliefors Critical Value	0.892	5% Lilliefors Critical Value	0.892
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	52.24	Mean	2.434
SD	116.6	SD	1.563
95% DL/2 (t) UCL	78.08	95% H-Stat (DL/2) UCL	49.82

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	2.204
		SD in Log Scale	2.023
		Mean in Original Scale	53.3
		SD in Original Scale	116.3
		95% Percentile Bootstrap UCL	81.46
		95% BCA Bootstrap UCL	88.11

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.06
Theta Star	155.2
nu star	36.04
A-D Test Statistic	0.301
5% A-D Critical Value	0.761
K-S Test Statistic	0.761
5% K-S Critical Value	0.214
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	18
Maximum	660
Mean	157.1
Median	153.2
SD	90.99
k star	3.586
Theta star	43.8
Nu star	408.8
AppChi2	363
95% Gamma Approximate UCL	176.9
95% Adjusted Gamma UCL	177.5

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	61.68
SD	111.8
SE of Mean	15.26
95% KM (t) UCL	87.21
95% KM (z) UCL	86.79
95% KM (jackknife) UCL	84.99
95% KM (bootstrap t) UCL	99.12
95% KM (BCA) UCL	102
95% KM (Percentile Bootstrap) UCL	94.28
95% KM (Chebyshev) UCL	128.2
97.5% KM (Chebyshev) UCL	157
99% KM (Chebyshev) UCL	213.5
Potential UCLs to Use	
95% KM (t) UCL	87.21

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(A)ANTHRACENE

General Statistics

Number of Valid Samples	45	Number of Detected Data	18
Number of Unique Samples	17	Number of Non-Detect Data	27
		Percent Non-Detects	60.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	11	Minimum Detected	2.398
Maximum Detected	3800	Maximum Detected	8.243
Mean of Detected	492	Mean of Detected	4.736
SD of Detected	999.1	SD of Detected	1.693
Minimum Non-Detect	2.2	Minimum Non-Detect	0.788
Maximum Non-Detect	2.2	Maximum Non-Detect	0.788

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.54	Shapiro Wilk Test Statistic	0.935
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	197.5	Mean	1.952
SD	667	SD	2.529
95% DL/2 (t) UCL	364.5	95% H-Stat (DL/2) UCL	431.6

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.548
		SD in Log Scale	3.238
		Mean in Original Scale	198
		SD in Original Scale	666.8
		95% Percentile Bootstrap UCL	379.2
		95% BCA Bootstrap UCL	485.3

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.406
Theta Star	1212
nu star	14.62
A-D Test Statistic	1.349
5% A-D Critical Value	0.812
K-S Test Statistic	0.812
5% K-S Critical Value	0.217
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	6649
Mean	1326
Median	230
SD	1869
k star	0.151
Theta star	8786
Nu star	13.58
AppChi2	6.286
95% Gamma Approximate UCL	2865
95% Adjusted Gamma UCL	2942

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Lognormal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	203.4
SD	657.8
SE of Mean	100.9
95% KM (t) UCL	372.9
95% KM (z) UCL	369.4
95% KM (jackknife) UCL	368.4
95% KM (bootstrap t) UCL	678.2
95% KM (BCA) UCL	391.2
95% KM (Percentile Bootstrap) UCL	388
95% KM (Chebyshev) UCL	643.2
97.5% KM (Chebyshev) UCL	833.5
99% KM (Chebyshev) UCL	1207
Potential UCLs to Use	
95% KM (Chebyshev) UCL	643.2

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(A)PYRENE

General Statistics

Number of Valid Samples	45	Number of Detected Data	19
Number of Unique Samples	17	Number of Non-Detect Data	26
		Percent Non-Detects	57.78%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	3.8	Minimum Detected	1.335
Maximum Detected	900	Maximum Detected	6.802
Mean of Detected	102.9	Mean of Detected	3.753
SD of Detected	205.5	SD of Detected	1.217
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	1.6	Maximum Non-Detect	0.47

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.469	Shapiro Wilk Test Statistic	0.937
5% Shapiro Wilk Critical Value	0.901	5% Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	43.9	Mean	1.456
SD	141	SD	2.133
95% DL/2 (t) UCL	79.21	95% H-Stat (DL/2) UCL	65.62
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.666
		SD in Log Scale	2.216
		Mean in Original Scale	44.71
		SD in Original Scale	140.7
		95% Percentile Bootstrap UCL	81.74
		95% BCA Bootstrap UCL	107.3

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.614
Theta Star	167.5
nu star	23.34
A-D Test Statistic	1.602
5% A-D Critical Value	0.785
K-S Test Statistic	0.785
5% K-S Critical Value	0.207
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	900
Mean	173.3
Median	54.91
SD	217.2
k star	0.189
Theta star	915.1
Nu star	17.04
AppChi2	8.704
95% Gamma Approximate UCL	339.4
95% Adjusted Gamma UCL	347.3

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Lognormal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	45.64
SD	138.9
SE of Mean	21.27
95% KM (t) UCL	81.37
95% KM (z) UCL	80.62
95% KM (jackknife) UCL	76.72
95% KM (bootstrap t) UCL	170.8
95% KM (BCA) UCL	98.36
95% KM (Percentile Bootstrap) UCL	87.31
95% KM (Chebyshev) UCL	138.4
97.5% KM (Chebyshev) UCL	178.5
99% KM (Chebyshev) UCL	257.3
Potential UCLs to Use	
95% KM (BCA) UCL	98.36

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(B)FLUORANTHENE

General Statistics

Number of Valid Samples	45	Number of Detected Data	27
Number of Unique Samples	25	Number of Non-Detect Data	18
		Percent Non-Detects	40.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	4.2	Minimum Detected	1.435
Maximum Detected	570	Maximum Detected	6.346
Mean of Detected	128.5	Mean of Detected	4.224
SD of Detected	145.8	SD of Detected	1.253
Minimum Non-Detect	1.7	Minimum Non-Detect	0.531
Maximum Non-Detect	1.7	Maximum Non-Detect	0.531

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.768	Shapiro Wilk Test Statistic	0.971
5% Shapiro Wilk Critical Value	0.923	5% Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	77.46	Mean	2.469
SD	128.7	SD	2.377
95% DL/2 (t) UCL	109.7	95% H-Stat (DL/2) UCL	391
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	21.76	Mean in Log Scale	2.979
SD	184.4	SD in Log Scale	1.918
95% MLE (t) UCL	67.96	Mean in Original Scale	78.86
95% MLE (Tiku) UCL	73.63	SD in Original Scale	127.9
		95% Percentile Bootstrap UCL	111
		95% BCA Bootstrap UCL	119.4

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.844
Theta Star	152.3
nu star	45.57
A-D Test Statistic	0.315
5% A-D Critical Value	0.777
K-S Test Statistic	0.777
5% K-S Critical Value	0.174
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0
Maximum	570
Mean	102.3
Median	63
SD	123.1
k star	0.223
Theta star	458.4
Nu star	20.08
AppChi2	10.91
95% Gamma Approximate UCL	188.2
95% Adjusted Gamma UCL	192.2

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	78.8
SD	126.5
SE of Mean	19.21
95% KM (t) UCL	111.1
95% KM (z) UCL	110.4
95% KM (jackknife) UCL	110.4
95% KM (bootstrap t) UCL	125
95% KM (BCA) UCL	118
95% KM (Percentile Bootstrap) UCL	110.7
95% KM (Chebyshev) UCL	162.5
97.5% KM (Chebyshev) UCL	198.8
99% KM (Chebyshev) UCL	269.9
Potential UCLs to Use	
95% KM (BCA) UCL	118

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DIBENZO(A,H)ANTHRACENE

General Statistics

Number of Valid Samples	45	Number of Detected Data	5
Number of Unique Samples	5	Number of Non-Detect Data	40
		Percent Non-Detects	88.89%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	19	Minimum Detected	2.944
Maximum Detected	110	Maximum Detected	4.7
Mean of Detected	59.81	Mean of Detected	3.853
SD of Detected	42.86	SD of Detected	0.796
Minimum Non-Detect	4.2	Minimum Non-Detect	1.435
Maximum Non-Detect	4.2	Maximum Non-Detect	1.435

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Test Statistic	0.893
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	8.512	Mean	1.088
SD	22.44	SD	1.017
95% DL/2 (t) UCL	14.13	95% H-Stat (DL/2) UCL	5.546
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	69.59	Mean in Log Scale	-0.275
SD	38.33	SD in Log Scale	2.395
95% MLE (t) UCL	79.2	Mean in Original Scale	8.248
95% MLE (Tiku) UCL	97.85	SD in Original Scale	22.67
		95% Percentile Bootstrap UCL	14.09
		95% BCA Bootstrap UCL	16.54

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.033
Theta Star	57.89
nu star	10.33
A-D Test Statistic	0.408
5% A-D Critical Value	0.684
K-S Test Statistic	0.684
5% K-S Critical Value	0.36
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	7.948
Maximum	967.5
Mean	444.4
Median	433.4
SD	303.1
k star	1.224
Theta star	363
Nu star	110.2
AppChi2	86.96
95% Gamma Approximate UCL	563.1
95% Adjusted Gamma UCL	567.6

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	23.53
SD	18.1
SE of Mean	3.017
95% KM (t) UCL	28.6
95% KM (z) UCL	28.5
95% KM (jackknife) UCL	28.42
95% KM (bootstrap t) UCL	27.47
95% KM (BCA) UCL	101.2
95% KM (Percentile Bootstrap) UCL	48.2
95% KM (Chebyshev) UCL	36.69
97.5% KM (Chebyshev) UCL	42.38
99% KM (Chebyshev) UCL	53.56
Potential UCLs to Use	
95% KM (t) UCL	28.6
95% KM (Percentile Bootstrap) UCL	48.2

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

INDENO(1,2,3-CD)PYRENE

General Statistics

Number of Valid Samples	45	Number of Detected Data	13
Number of Unique Samples	13	Number of Non-Detect Data	32
		Percent Non-Detects	71.11%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	6.9	Minimum Detected	1.932
Maximum Detected	650	Maximum Detected	6.477
Mean of Detected	164.4	Mean of Detected	4.435
SD of Detected	181.6	SD of Detected	1.385
Minimum Non-Detect	2.5	Minimum Non-Detect	0.916
Maximum Non-Detect	20	Maximum Non-Detect	2.996

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	35
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	10
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	77.78%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.796	Shapiro Wilk Test Statistic	0.935
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	48.57	Mean	1.486
SD	120.7	SD	2.057
95% DL/2 (t) UCL	78.81	95% H-Stat (DL/2) UCL	60.48

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.109
		SD in Log Scale	2.761
		Mean in Original Scale	49.24
		SD in Original Scale	120.5
		95% Percentile Bootstrap UCL	82.05
		95% BCA Bootstrap UCL	95.71

Table C.9-4
EPC Calculation Results - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.727	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	226		
nu star	18.91		
A-D Test Statistic	0.23	**Nonparametric Statistics**	
5% A-D Critical Value	0.764	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.764	Mean	52.4
5% K-S Critical Value	0.244	SD	117.9
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	18.29
		95% KM (t) UCL	83.13
Assuming Gamma Distribution		95% KM (z) UCL	82.48
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	80.02
Minimum	0	95% KM (bootstrap t) UCL	108.2
Maximum	1604	95% KM (BCA) UCL	103.6
Mean	521.3	95% KM (Percentile Bootstrap) UCL	91.26
Median	384.7	95% KM (Chebyshev) UCL	132.1
SD	490.1	97.5% KM (Chebyshev) UCL	166.6
k star	0.293	99% KM (Chebyshev) UCL	234.4
Theta star	1780		
Nu star	26.35	**Potential UCLs to Use**	
AppChi2	15.65	95% KM (t) UCL	83.13
95% Gamma Approximate UCL	877.7		
95% Adjusted Gamma UCL	893.3		

Note: DL/2 is not a recommended method.

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ALUMINUM (mg/kg)

General Statistics

Number of Valid Samples	7	Number of Unique Samples	7

Raw Statistics		**Log-transformed Statistics**	
Minimum	3460	Minimum of Log Data	8.149
Maximum	33000	Maximum of Log Data	10.4
Mean	10456	Mean of log Data	8.933
Median	6510	SD of log Data	0.805
SD	10571		
Coefficient of Variation	1.011		
Skewness	2.092		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.717	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	18220	95% H-UCL	29632
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	23132
95% Adjusted-CLT UCL	20403	97.5% Chebyshev (MVUE) UCL	28853
95% Modified-t UCL	18746	99% Chebyshev (MVUE) UCL	40092

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.067	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	9804		
nu star	14.93		
Approximate Chi Square Value (.05)	7.214	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	17028
Adjusted Chi Square Value	5.674	95% Jackknife UCL	18220
		95% Standard Bootstrap UCL	16638
Anderson-Darling Test Statistic	0.548	95% Bootstrap-t UCL	42438
Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL	47138
Kolmogorov-Smirnov Test Statistic	0.254	95% Percentile Bootstrap UCL	17106
Kolmogorov-Smirnov 5% Critical Value	0.316	95% BCA Bootstrap UCL	20187
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	27872
		97.5% Chebyshev(Mean, Sd) UCL	35408
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	50212
95% Approximate Gamma UCL	21642		
95% Adjusted Gamma UCL	27515		

Potential UCL to Use		Use 95% Approximate Gamma UCL	21642

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ANTIMONY (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.2	Minimum of Log Data	-1.609
Maximum	16.4	Maximum of Log Data	2.797
Mean	2.834	Mean of log Data	-0.284
Median	0.53	SD of log Data	1.513
SD	5.998		
Coefficient of Variation	2.116		
Skewness	2.617		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.512	Shapiro Wilk Test Statistic	0.829
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	7.24	95% H-UCL	59.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.258
95% Adjusted-CLT UCL	8.959	97.5% Chebyshev (MVUE) UCL	8.176
95% Modified-t UCL	7.613	99% Chebyshev (MVUE) UCL	11.94
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.371	Data appear Lognormal at 5% Significance Level	
Theta Star	7.646		
nu star	5.189		
Approximate Chi Square Value (.05)	1.241	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	6.563
Adjusted Chi Square Value	0.754	95% Jackknife UCL	7.24
		95% Standard Bootstrap UCL	6.366
Anderson-Darling Test Statistic	1.066	95% Bootstrap-t UCL	91.43
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	44.06
Kolmogorov-Smirnov Test Statistic	0.345	95% Percentile Bootstrap UCL	7.317
Kolmogorov-Smirnov 5% Critical Value	0.328	95% BCA Bootstrap UCL	7.76
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.72
		97.5% Chebyshev(Mean, Sd) UCL	16.99
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	25.39
95% Approximate Gamma UCL	11.85		
95% Adjusted Gamma UCL	19.51		
Potential UCL to Use		Use 99% Chebyshev (MVUE) UCL	11.94

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	4.7	Minimum of Log Data	1.548
Maximum	16.1	Maximum of Log Data	2.779
Mean	10.41	Mean of log Data	2.221
Median	9.7	SD of log Data	0.55
SD	5.215		
Coefficient of Variation	0.501		
Skewness	0.0727		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.831	Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	14.24	95% H-UCL	19.07
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.01
95% Adjusted-CLT UCL	13.71	97.5% Chebyshev (MVUE) UCL	24.14
95% Modified-t UCL	14.25	99% Chebyshev (MVUE) UCL	32.24
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.519	Data appear Normal at 5% Significance Level	
Theta Star	4.134		
nu star	35.27		
Approximate Chi Square Value (.05)	22.68	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	13.66
Adjusted Chi Square Value	19.69	95% Jackknife UCL	14.24
		95% Standard Bootstrap UCL	13.41
Anderson-Darling Test Statistic	0.563	95% Bootstrap-t UCL	14.58
Anderson-Darling 5% Critical Value	0.71	95% Hall's Bootstrap UCL	12.76
Kolmogorov-Smirnov Test Statistic	0.259	95% Percentile Bootstrap UCL	13.34
Kolmogorov-Smirnov 5% Critical Value	0.313	95% BCA Bootstrap UCL	13.61
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.01
		97.5% Chebyshev(Mean, Sd) UCL	22.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30.02
95% Approximate Gamma UCL	16.19		
95% Adjusted Gamma UCL	18.65		
Potential UCL to Use		Use 95% Student's-t UCL	14.24

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CALCIUM (mg/kg)

General Statistics

Number of Valid Samples	7	Number of Unique Samples	7

Raw Statistics		**Log-transformed Statistics**	
Minimum	2610	Minimum of Log Data	7.867
Maximum	172000	Maximum of Log Data	12.06
Mean	77373	Mean of log Data	10.37
Median	18000	SD of log Data	1.657
SD	82490		
Coefficient of Variation	1.066		
Skewness	0.37		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.728	Shapiro Wilk Test Statistic	0.856
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	137958	95% H-UCL	5816662
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	327415
95% Adjusted-CLT UCL	133319	97.5% Chebyshev (MVUE) UCL	430002
95% Modified-t UCL	138685	99% Chebyshev (MVUE) UCL	631515

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.485	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	159419		
nu star	6.795		
Approximate Chi Square Value (.05)	2.059	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	128657
Adjusted Chi Square Value	1.365	95% Jackknife UCL	137958
		95% Standard Bootstrap UCL	125521
Anderson-Darling Test Statistic	0.713	95% Bootstrap-t UCL	142335
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	104830
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	122944
Kolmogorov-Smirnov 5% Critical Value	0.324	95% BCA Bootstrap UCL	123286
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	213276
		97.5% Chebyshev(Mean, Sd) UCL	272082
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	387594
95% Approximate Gamma UCL	255378		
95% Adjusted Gamma UCL	385206		

Potential UCL to Use		Use 95% Approximate Gamma UCL	255378
Recommended UCL exceeds the maximum observation			

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	11	Minimum of Log Data	2.398
Maximum	47	Maximum of Log Data	3.85
Mean	21.16	Mean of log Data	2.904
Median	14.4	SD of log Data	0.568
SD	13.33		
Coefficient of Variation	0.63		
Skewness	1.41		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.803	Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	30.95	95% H-UCL	39.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	40.6
95% Adjusted-CLT UCL	32.32	97.5% Chebyshev (MVUE) UCL	49.12
95% Modified-t UCL	31.4	99% Chebyshev (MVUE) UCL	65.85
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.115	Data appear Normal at 5% Significance Level	
Theta Star	10		
nu star	29.61		
Approximate Chi Square Value (.05)	18.18	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	29.45
Adjusted Chi Square Value	15.54	95% Jackknife UCL	30.95
		95% Standard Bootstrap UCL	28.88
Anderson-Darling Test Statistic	0.575	95% Bootstrap-t UCL	38.17
Anderson-Darling 5% Critical Value	0.711	95% Hall's Bootstrap UCL	32.16
Kolmogorov-Smirnov Test Statistic	0.262	95% Percentile Bootstrap UCL	29.23
Kolmogorov-Smirnov 5% Critical Value	0.313	95% BCA Bootstrap UCL	31.57
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	43.12
		97.5% Chebyshev(Mean, Sd) UCL	52.63
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	71.3
95% Approximate Gamma UCL	34.45		
95% Adjusted Gamma UCL	40.3		
Potential UCL to Use		Use 95% Student's-t UCL	30.95

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	2.65	Minimum of Log Data	0.975
Maximum	13	Maximum of Log Data	2.565
Mean	5.507	Mean of log Data	1.54
Median	3.7	SD of log Data	0.589
SD	3.817		
Coefficient of Variation	0.693		
Skewness	1.617		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.78	Shapiro Wilk Test Statistic	0.878
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.311	95% H-UCL	10.49
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.67
95% Adjusted-CLT UCL	8.822	97.5% Chebyshev (MVUE) UCL	12.95
95% Modified-t UCL	8.458	99% Chebyshev (MVUE) UCL	17.42
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.904	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.893		
nu star	26.65		
Approximate Chi Square Value (.05)	15.88	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	7.88
Adjusted Chi Square Value	13.44	95% Jackknife UCL	8.311
		95% Standard Bootstrap UCL	7.738
Anderson-Darling Test Statistic	0.576	95% Bootstrap-t UCL	16.03
Anderson-Darling 5% Critical Value	0.712	95% Hall's Bootstrap UCL	20.93
Kolmogorov-Smirnov Test Statistic	0.262	95% Percentile Bootstrap UCL	7.886
Kolmogorov-Smirnov 5% Critical Value	0.314	95% BCA Bootstrap UCL	8.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.8
		97.5% Chebyshev(Mean, Sd) UCL	14.52
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.86
95% Approximate Gamma UCL	9.242		
95% Adjusted Gamma UCL	10.92		
Potential UCL to Use		Use 95% Approximate Gamma UCL	9.242

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	2.65	Minimum of Log Data	0.975
Maximum	13	Maximum of Log Data	2.565
Mean	5.507	Mean of log Data	1.54
Median	3.7	SD of log Data	0.589
SD	3.817		
Coefficient of Variation	0.693		
Skewness	1.617		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.78	Shapiro Wilk Test Statistic	0.878
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.311	95% H-UCL	10.49
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.67
95% Adjusted-CLT UCL	8.822	97.5% Chebyshev (MVUE) UCL	12.95
95% Modified-t UCL	8.458	99% Chebyshev (MVUE) UCL	17.42
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.904	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.893		
nu star	26.65		
Approximate Chi Square Value (.05)	15.88	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	7.88
Adjusted Chi Square Value	13.44	95% Jackknife UCL	8.311
		95% Standard Bootstrap UCL	7.689
Anderson-Darling Test Statistic	0.576	95% Bootstrap-t UCL	17.37
Anderson-Darling 5% Critical Value	0.712	95% Hall's Bootstrap UCL	21.55
Kolmogorov-Smirnov Test Statistic	0.262	95% Percentile Bootstrap UCL	7.771
Kolmogorov-Smirnov 5% Critical Value	0.314	95% BCA Bootstrap UCL	8.45
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.8
		97.5% Chebyshev(Mean, Sd) UCL	14.52
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.86
95% Approximate Gamma UCL	9.242		
95% Adjusted Gamma UCL	10.92		
Potential UCL to Use		Use 95% Approximate Gamma UCL	9.242

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COPPER (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	15.8	Minimum of Log Data	2.76
Maximum	40	Maximum of Log Data	3.689
Mean	26.26	Mean of log Data	3.22
Median	26	SD of log Data	0.344
SD	8.565		
Coefficient of Variation	0.326		
Skewness	0.209		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Test Statistic	0.903
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	32.55	95% H-UCL	36.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	41.24
95% Adjusted-CLT UCL	31.86	97.5% Chebyshev (MVUE) UCL	47.7
95% Modified-t UCL	32.6	99% Chebyshev (MVUE) UCL	60.39
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.066	Data appear Normal at 5% Significance Level	
Theta Star	4.33		
nu star	84.93		
Approximate Chi Square Value (.05)	64.68	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	31.59
Adjusted Chi Square Value	59.37	95% Jackknife UCL	32.55
		95% Standard Bootstrap UCL	31.07
Anderson-Darling Test Statistic	0.385	95% Bootstrap-t UCL	32.73
Anderson-Darling 5% Critical Value	0.708	95% Hall's Bootstrap UCL	32.68
Kolmogorov-Smirnov Test Statistic	0.243	95% Percentile Bootstrap UCL	31.14
Kolmogorov-Smirnov 5% Critical Value	0.312	95% BCA Bootstrap UCL	31.15
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	40.38
		97.5% Chebyshev(Mean, Sd) UCL	46.48
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	58.47
95% Approximate Gamma UCL	34.48		
95% Adjusted Gamma UCL	37.57		
Potential UCL to Use		Use 95% Student's-t UCL	32.55

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	6730	Minimum of Log Data	8.814
Maximum	34000	Maximum of Log Data	10.43
Mean	15416	Mean of log Data	9.477
Median	11100	SD of log Data	0.597
SD	10364		
Coefficient of Variation	0.672		
Skewness	1.322		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.792	Shapiro Wilk Test Statistic	0.885
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	23028	95% H-UCL	29859
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	30162
95% Adjusted-CLT UCL	23951	97.5% Chebyshev (MVUE) UCL	36651
95% Modified-t UCL	23354	99% Chebyshev (MVUE) UCL	49397
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.906	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	8089		
nu star	26.68		
Approximate Chi Square Value (.05)	15.91	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	21859
Adjusted Chi Square Value	13.46	95% Jackknife UCL	23028
		95% Standard Bootstrap UCL	21521
Anderson-Darling Test Statistic	0.602	95% Bootstrap-t UCL	48267
Anderson-Darling 5% Critical Value	0.712	95% Hall's Bootstrap UCL	76595
Kolmogorov-Smirnov Test Statistic	0.309	95% Percentile Bootstrap UCL	22484
Kolmogorov-Smirnov 5% Critical Value	0.314	95% BCA Bootstrap UCL	23161
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	32491
		97.5% Chebyshev(Mean, Sd) UCL	39879
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	54392
95% Approximate Gamma UCL	25860		
95% Adjusted Gamma UCL	30561		
Potential UCL to Use		Use 95% Approximate Gamma UCL	25860

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
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SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	9.9	Minimum of Log Data	2.293
Maximum	366	Maximum of Log Data	5.903
Mean	80.45	Mean of log Data	3.644
Median	39.75	SD of log Data	1.22
SD	127.5		
Coefficient of Variation	1.585		
Skewness	2.511		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.599	Shapiro Wilk Test Statistic	0.924
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	174.1	95% H-UCL	698.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	208
95% Adjusted-CLT UCL	208.6	97.5% Chebyshev (MVUE) UCL	268
95% Modified-t UCL	181.7	99% Chebyshev (MVUE) UCL	385.9
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.552	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	145.9		
nu star	7.722		
Approximate Chi Square Value (.05)	2.575	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	159.7
Adjusted Chi Square Value	1.769	95% Jackknife UCL	174.1
		95% Standard Bootstrap UCL	153.1
Anderson-Darling Test Statistic	0.611	95% Bootstrap-t UCL	551.3
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	518.2
Kolmogorov-Smirnov Test Statistic	0.269	95% Percentile Bootstrap UCL	172.7
Kolmogorov-Smirnov 5% Critical Value	0.322	95% BCA Bootstrap UCL	187.2
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	290.5
		97.5% Chebyshev(Mean, Sd) UCL	381.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	560
95% Approximate Gamma UCL	241.3		
95% Adjusted Gamma UCL	351.2		
Potential UCL to Use		Use 95% Approximate Gamma UCL	241.3

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
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SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	83.7	Minimum of Log Data	4.427
Maximum	550	Maximum of Log Data	6.31
Mean	204.2	Mean of log Data	5.084
Median	130	SD of log Data	0.69
SD	172		
Coefficient of Variation	0.842		
Skewness	1.764		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.734	Shapiro Wilk Test Statistic	0.847
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	330.5	95% H-UCL	461.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	422.5
95% Adjusted-CLT UCL	357.4	97.5% Chebyshev (MVUE) UCL	520.1
95% Modified-t UCL	337.7	99% Chebyshev (MVUE) UCL	711.8
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.397	Data appear Lognormal at 5% Significance Level	
Theta Star	146.1		
nu star	19.56		
Approximate Chi Square Value (.05)	10.53	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	311.1
Adjusted Chi Square Value	8.602	95% Jackknife UCL	330.5
		95% Standard Bootstrap UCL	304
Anderson-Darling Test Statistic	0.734	95% Bootstrap-t UCL	995.5
Anderson-Darling 5% Critical Value	0.714	95% Hall's Bootstrap UCL	1127
Kolmogorov-Smirnov Test Statistic	0.357	95% Percentile Bootstrap UCL	322.1
Kolmogorov-Smirnov 5% Critical Value	0.315	95% BCA Bootstrap UCL	336
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	487.5
		97.5% Chebyshev(Mean, Sd) UCL	610.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	851
95% Approximate Gamma UCL	379.3		
95% Adjusted Gamma UCL	464.3		
Potential UCL to Use		Use 95% H-UCL	461.3

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
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Radford Army Ammunition Plant, Radford, Virginia

MERCURY (mg/kg)

General Statistics

Number of Valid Samples	7	Number of Unique Samples	7

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.019	Minimum of Log Data	-3.963
Maximum	0.49	Maximum of Log Data	-0.713
Mean	0.167	Mean of log Data	-2.314
Median	0.13	SD of log Data	1.217
SD	0.166		
Coefficient of Variation	0.991		
Skewness	1.373		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.871	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.289	95% H-UCL	1.782
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.536
95% Adjusted-CLT UCL	0.305	97.5% Chebyshev (MVUE) UCL	0.69
95% Modified-t UCL	0.295	99% Chebyshev (MVUE) UCL	0.993

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.716	**Data appear Normal at 5% Significance Level**	
Theta Star	0.234		
nu star	10.02		
Approximate Chi Square Value (.05)	3.956	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	0.271
Adjusted Chi Square Value	2.892	95% Jackknife UCL	0.289
		95% Standard Bootstrap UCL	0.263
Anderson-Darling Test Statistic	0.214	95% Bootstrap-t UCL	0.357
Anderson-Darling 5% Critical Value	0.726	95% Hall's Bootstrap UCL	0.723
Kolmogorov-Smirnov Test Statistic	0.173	95% Percentile Bootstrap UCL	0.268
Kolmogorov-Smirnov 5% Critical Value	0.319	95% BCA Bootstrap UCL	0.294
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.441
		97.5% Chebyshev(Mean, Sd) UCL	0.559
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.791
95% Approximate Gamma UCL	0.424		
95% Adjusted Gamma UCL	0.58		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.289

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
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NICKEL (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.7	Minimum of Log Data	1.902
Maximum	33	Maximum of Log Data	3.497
Mean	14.8	Mean of log Data	2.536
Median	13	SD of log Data	0.597
SD	9.438		
Coefficient of Variation	0.638		
Skewness	1.344		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.857	Shapiro Wilk Test Statistic	0.923
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	21.73	95% H-UCL	28.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	29.2
95% Adjusted-CLT UCL	22.6	97.5% Chebyshev (MVUE) UCL	35.49
95% Modified-t UCL	22.03	99% Chebyshev (MVUE) UCL	47.84
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.989	Data appear Normal at 5% Significance Level	
Theta Star	7.44		
nu star	27.85		
Approximate Chi Square Value (.05)	16.81	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	20.67
Adjusted Chi Square Value	14.29	95% Jackknife UCL	21.73
		95% Standard Bootstrap UCL	20.14
Anderson-Darling Test Statistic	0.343	95% Bootstrap-t UCL	26.26
Anderson-Darling 5% Critical Value	0.711	95% Hall's Bootstrap UCL	41.74
Kolmogorov-Smirnov Test Statistic	0.229	95% Percentile Bootstrap UCL	20.26
Kolmogorov-Smirnov 5% Critical Value	0.313	95% BCA Bootstrap UCL	21.66
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	30.35
		97.5% Chebyshev(Mean, Sd) UCL	37.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	50.29
95% Approximate Gamma UCL	24.52		
95% Adjusted Gamma UCL	28.85		
Potential UCL to Use		Use 95% Student's-t UCL	21.73

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
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VANADIUM (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	11.6	Minimum of Log Data	2.451
Maximum	91	Maximum of Log Data	4.511
Mean	27.94	Mean of log Data	3.051
Median	17.2	SD of log Data	0.714
SD	28.42		
Coefficient of Variation	1.018		
Skewness	2.423		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.629	Shapiro Wilk Test Statistic	0.817
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	48.81	95% H-UCL	64.21
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	57.11
95% Adjusted-CLT UCL	56.12	97.5% Chebyshev (MVUE) UCL	70.51
95% Modified-t UCL	50.45	99% Chebyshev (MVUE) UCL	96.82
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.205	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	23.19		
nu star	16.86		
Approximate Chi Square Value (.05)	8.575	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	45.61
Adjusted Chi Square Value	6.867	95% Jackknife UCL	48.81
		95% Standard Bootstrap UCL	44.37
Anderson-Darling Test Statistic	0.845	95% Bootstrap-t UCL	144
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	131.3
Kolmogorov-Smirnov Test Statistic	0.291	95% Percentile Bootstrap UCL	47.74
Kolmogorov-Smirnov 5% Critical Value	0.315	95% BCA Bootstrap UCL	53.41
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	74.77
		97.5% Chebyshev(Mean, Sd) UCL	95.03
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	134.8
95% Approximate Gamma UCL	54.94		
95% Adjusted Gamma UCL	68.6		
Potential UCL to Use		Use 95% Approximate Gamma UCL	54.94

Table C.9-5
EPC Calculation Results - SWMU 71 Surface Soil
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SWMUs 40 and 71 RFI/CMS Report
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ZINC (mg/kg)

General Statistics			
Number of Valid Samples	7	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	24.5	Minimum of Log Data	3.199
Maximum	152	Maximum of Log Data	5.024
Mean	69.16	Mean of log Data	4.024
Median	45	SD of log Data	0.69
SD	50.65		
Coefficient of Variation	0.732		
Skewness	1.106		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.81	Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	106.4	95% H-UCL	159.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	146.2
95% Adjusted-CLT UCL	109.2	97.5% Chebyshev (MVUE) UCL	180
95% Modified-t UCL	107.7	99% Chebyshev (MVUE) UCL	246.3
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.525	Data appear Normal at 5% Significance Level	
Theta Star	45.36		
nu star	21.35		
Approximate Chi Square Value (.05)	11.85	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0158	95% CLT UCL	100.7
Adjusted Chi Square Value	9.787	95% Jackknife UCL	106.4
		95% Standard Bootstrap UCL	97.61
Anderson-Darling Test Statistic	0.484	95% Bootstrap-t UCL	194.1
Anderson-Darling 5% Critical Value	0.714	95% Hall's Bootstrap UCL	343.7
Kolmogorov-Smirnov Test Statistic	0.233	95% Percentile Bootstrap UCL	99.68
Kolmogorov-Smirnov 5% Critical Value	0.314	95% BCA Bootstrap UCL	104.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	152.6
		97.5% Chebyshev(Mean, Sd) UCL	188.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	259.7
95% Approximate Gamma UCL	124.6		
95% Adjusted Gamma UCL	150.9		
Potential UCL to Use		Use 95% Student's-t UCL	106.4

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

CADMIUM

General Statistics

Number of Valid Samples	7	Number of Detected Data	6
Number of Unique Samples	6	Number of Non-Detect Data	1
		Percent Non-Detects	14.29%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.03	Minimum Detected	-3.507
Maximum Detected	0.31	Maximum Detected	-1.171
Mean of Detected	0.155	Mean of Detected	-2.137
SD of Detected	0.106	SD of Detected	0.886
Minimum Non-Detect	0.03	Minimum Non-Detect	-3.507
Maximum Non-Detect	0.03	Maximum Non-Detect	-3.507

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.967	Shapiro Wilk Test Statistic	0.936
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.135	Mean	-2.432
SD	0.11	SD	1.123
95% DL/2 (t) UCL	0.215	95% H-Stat (DL/2) UCL	0.508
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.128	Mean in Log Scale	-2.45
SD	0.112	SD in Log Scale	1.157
95% MLE (t) UCL	0.21	Mean in Original Scale	0.134
95% MLE (Tiku) UCL	0.21	SD in Original Scale	0.11
		95% Percentile Bootstrap UCL	0.2
		95% BCA Bootstrap UCL	0.205

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.113
Theta Star	0.139
nu star	13.36
A-D Test Statistic	0.225
5% A-D Critical Value	0.704
K-S Test Statistic	0.704
5% K-S Critical Value	0.336
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.0013
Maximum	0.31
Mean	0.133
Median	0.13
SD	0.112
k star	0.542
Theta star	0.244
Nu star	7.594
AppChi2	2.502
95% Gamma Approximate UCL	0.402
95% Adjusted Gamma UCL	0.588

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.137
SD	0.0993
SE of Mean	0.0411
95% KM (t) UCL	0.217
95% KM (z) UCL	0.204
95% KM (jackknife) UCL	0.215
95% KM (bootstrap t) UCL	0.232
95% KM (BCA) UCL	0.213
95% KM (Percentile Bootstrap) UCL	0.212
95% KM (Chebyshev) UCL	0.316
97.5% KM (Chebyshev) UCL	0.393
99% KM (Chebyshev) UCL	0.546
Potential UCLs to Use	
95% KM (t) UCL	0.217
95% KM (Percentile Bootstrap) UCL	0.212

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SELENIUM (mg/kg)

General Statistics

Number of Valid Samples	7	Number of Detected Data	5
Number of Unique Samples	5	Number of Non-Detect Data	2
		Percent Non-Detects	28.57%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.25	Minimum Detected	-1.386
Maximum Detected	1.1	Maximum Detected	0.0953
Mean of Detected	0.638	Mean of Detected	-0.552
SD of Detected	0.303	SD of Detected	0.531
Minimum Non-Detect	0.31	Minimum Non-Detect	-1.171
Maximum Non-Detect	0.32	Maximum Non-Detect	-1.139

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	3
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	42.86%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.894	Shapiro Wilk Test Statistic	0.88
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.501	Mean	-0.922
SD	0.341	SD	0.767
95% DL/2 (t) UCL	0.751	95% H-Stat (DL/2) UCL	1.163
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.742	Mean in Log Scale	-0.771
SD	0.211	SD in Log Scale	0.573
95% MLE (t) UCL	0.897	Mean in Original Scale	0.532
95% MLE (Tiku) UCL	0.945	SD in Original Scale	0.306
		95% Percentile Bootstrap UCL	0.721
		95% BCA Bootstrap UCL	0.749

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.154	Data appear Normal at 5% Significance Level	
Theta Star	0.296		
nu star	21.54		
A-D Test Statistic	0.461	**Nonparametric Statistics**	
5% A-D Critical Value	0.681	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.681	Mean	0.527
5% K-S Critical Value	0.358	SD	0.288
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.122
		95% KM (t) UCL	0.764
Assuming Gamma Distribution		95% KM (z) UCL	0.727
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.781
Minimum	0.25	95% KM (bootstrap t) UCL	0.734
Maximum	1.1	95% KM (BCA) UCL	0.82
Mean	0.59	95% KM (Percentile Bootstrap) UCL	0.756
Median	0.6	95% KM (Chebyshev) UCL	1.058
SD	0.26	97.5% KM (Chebyshev) UCL	1.288
k star	3.674	99% KM (Chebyshev) UCL	1.739
Theta star	0.161		
Nu star	51.44	**Potential UCLs to Use**	
AppChi2	35.97	95% KM (t) UCL	0.764
95% Gamma Approximate UCL	0.844	95% KM (Percentile Bootstrap) UCL	0.756
95% Adjusted Gamma UCL	0.946		

Note: DL/2 is not a recommended method.

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

THALLIUM (mg/kg)

General Statistics

Number of Valid Samples	6	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	3
		Percent Non-Detects	50.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.35	Minimum Detected	-1.05
Maximum Detected	0.59	Maximum Detected	-0.528
Mean of Detected	0.443	Mean of Detected	-0.84
SD of Detected	0.129	SD of Detected	0.276
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.28	Maximum Non-Detect	-1.273

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	3
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	50.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.871	Shapiro Wilk Test Statistic	0.897
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.288	Mean	-1.434
SD	0.189	SD	0.675
95% DL/2 (t) UCL	0.443	95% H-Stat (DL/2) UCL	0.38
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.286	Mean in Log Scale	-1.285
SD	0.191	SD in Log Scale	0.518
95% MLE (t) UCL	0.444	Mean in Original Scale	0.31
95% MLE (Tiku) UCL	0.48	SD in Original Scale	0.167
		95% Percentile Bootstrap UCL	0.419
		95% BCA Bootstrap UCL	0.419

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	0.406
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	N/A
Maximum	N/A
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
AppChi2	N/A
95% Gamma Approximate UCL	N/A
95% Adjusted Gamma UCL	N/A

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.397
SD	0.0877
SE of Mean	0.0438
95% KM (t) UCL	0.485
95% KM (z) UCL	0.469
95% KM (jackknife) UCL	0.474
95% KM (bootstrap t) UCL	0.646
95% KM (BCA) UCL	0.59
95% KM (Percentile Bootstrap) UCL	0.59
95% KM (Chebyshev) UCL	0.588
97.5% KM (Chebyshev) UCL	0.67
99% KM (Chebyshev) UCL	0.833
Potential UCLs to Use	
95% KM (t) UCL	0.485
95% KM (Percentile Bootstrap) UCL	0.59

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ALDRIN (ug/kg)

General Statistics

Number of Valid Samples	4	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	2
		Percent Non-Detects	50.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.86	Minimum Detected	-0.151
Maximum Detected	1.05	Maximum Detected	0.0488
Mean of Detected	0.955	Mean of Detected	-0.051
SD of Detected	0.134	SD of Detected	0.141
Minimum Non-Detect	0.17	Minimum Non-Detect	-1.772
Maximum Non-Detect	0.17	Maximum Non-Detect	-1.772

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.52	Mean	-1.258
SD	0.508	SD	1.396
95% DL/2 (t) UCL	1.118	95% H-Stat (DL/2) UCL	152.9

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	0.359
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	N/A
Maximum	N/A
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
AppChi2	N/A
95% Gamma Approximate UCL	N/A
95% Adjusted Gamma UCL	N/A
Note: DL/2 is not a recommended method.	

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.908
SD	0.0823
SE of Mean	0.0582
95% KM (t) UCL	1.044
95% KM (z) UCL	1.003
95% KM (jackknife) UCL	1.094
95% KM (bootstrap t) UCL	0.908
95% KM (BCA) UCL	1.05
95% KM (Percentile Bootstrap) UCL	1.05
95% KM (Chebyshev) UCL	1.161
97.5% KM (Chebyshev) UCL	1.271
99% KM (Chebyshev) UCL	1.486
Potential UCLs to Use	
95% KM (t) UCL	1.044
95% KM (% Bootstrap) UCL	1.05

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BETA-BHC (ug/kg)

General Statistics

Number of Valid Samples	4	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	2
		Percent Non-Detects	50.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	3.4	Minimum Detected	1.224
Maximum Detected	5.5	Maximum Detected	1.705
Mean of Detected	4.45	Mean of Detected	1.464
SD of Detected	1.485	SD of Detected	0.34
Minimum Non-Detect	0.28	Minimum Non-Detect	-1.273
Maximum Non-Detect	0.28	Maximum Non-Detect	-1.273

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.295	Mean	-0.251
SD	2.632	SD	1.99
95% DL/2 (t) UCL	5.392	95% H-Stat (DL/2) UCL	2569

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	0.359
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	N/A
Maximum	N/A
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
AppChi2	N/A
95% Gamma Approximate UCL	N/A
95% Adjusted Gamma UCL	N/A

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	3.925
SD	0.909
SE of Mean	0.643
95% KM (t) UCL	5.438
95% KM (z) UCL	4.983
95% KM (jackknife) UCL	5.984
95% KM (bootstrap t) UCL	3.925
95% KM (BCA) UCL	5.5
95% KM (Percentile Bootstrap) UCL	5.5
95% KM (Chebyshev) UCL	6.728
97.5% KM (Chebyshev) UCL	7.94
99% KM (Chebyshev) UCL	10.32
Potential UCLs to Use	
95% KM (t) UCL	5.438
95% KM (% Bootstrap) UCL	5.5

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

4-METHYL-2-PENTANONE (ug/kg)

General Statistics

Number of Valid Samples	4	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	1
		Percent Non-Detects	25.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2	Minimum Detected	0.693
Maximum Detected	16	Maximum Detected	2.773
Mean of Detected	7	Mean of Detected	1.521
SD of Detected	7.81	SD of Detected	1.102
Minimum Non-Detect	0.6	Minimum Non-Detect	-0.511
Maximum Non-Detect	0.6	Maximum Non-Detect	-0.511

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.803	Shapiro Wilk Test Statistic	0.89
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.325	Mean	0.84
SD	7.203	SD	1.633
95% DL/2 (t) UCL	13.8	95% H-Stat (DL/2) UCL	1577
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	4.15	Mean in Log Scale	0.763
SD	7.675	SD in Log Scale	1.763
95% MLE (t) UCL	13.18	Mean in Original Scale	5.305
95% MLE (Tiku) UCL	13.41	SD in Original Scale	7.222
		95% Percentile Bootstrap UCL	9.5
		95% BCA Bootstrap UCL	9.5

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	0.449
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	N/A
Maximum	N/A
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
AppChi2	N/A
95% Gamma Approximate UCL	N/A
95% Adjusted Gamma UCL	N/A
Note: DL/2 is not a recommended method.	

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	5.75
SD	5.932
SE of Mean	3.633
95% KM (t) UCL	14.3
95% KM (z) UCL	11.72
95% KM (jackknife) UCL	13.79
95% KM (bootstrap t) UCL	56.61
95% KM (BCA) UCL	12.75
95% KM (Percentile Bootstrap) UCL	16
95% KM (Chebyshev) UCL	21.58
97.5% KM (Chebyshev) UCL	28.44
99% KM (Chebyshev) UCL	41.89
Potential UCLs to Use	
95% KM (t) UCL	14.3
95% KM (Percentile Bootstrap) UCL	16

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR-1254 (ug/kg)

General Statistics

Number of Valid Samples	7	Number of Detected Data	6
Number of Unique Samples	6	Number of Non-Detect Data	1
		Percent Non-Detects	14.29%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	24	Minimum Detected	3.178
Maximum Detected	460	Maximum Detected	6.131
Mean of Detected	143	Mean of Detected	4.49
SD of Detected	162.2	SD of Detected	1.063
Minimum Non-Detect	8	Minimum Non-Detect	2.079
Maximum Non-Detect	8	Maximum Non-Detect	2.079

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.755	Shapiro Wilk Test Statistic	0.967
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	123.1	Mean	4.046
SD	157.1	SD	1.522
95% DL/2 (t) UCL	238.5	95% H-Stat (DL/2) UCL	2995
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	109.6	Mean in Log Scale	4.104
SD	162.6	SD in Log Scale	1.409
95% MLE (t) UCL	229	Mean in Original Scale	123.4
95% MLE (Tiku) UCL	225.8	SD in Original Scale	156.8
		95% Percentile Bootstrap UCL	230.6
		95% BCA Bootstrap UCL	250.6

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.709	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	201.7		
nu star	8.508		
A-D Test Statistic	0.305	**Nonparametric Statistics**	
5% A-D Critical Value	0.712	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.712	Mean	126
5% K-S Critical Value	0.34	SD	143.2
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	59.3
		95% KM (t) UCL	241.2
Assuming Gamma Distribution		95% KM (z) UCL	223.5
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	239
Minimum	0	95% KM (bootstrap t) UCL	438.6
Maximum	460	95% KM (BCA) UCL	237.3
Mean	122.6	95% KM (Percentile Bootstrap) UCL	231.1
Median	83	95% KM (Chebyshev) UCL	384.5
SD	157.6	97.5% KM (Chebyshev) UCL	496.4
k star	0.203	99% KM (Chebyshev) UCL	716.1
Theta star	602.6		
Nu star	2.848	**Potential UCLs to Use**	
AppChi2	0.329	95% KM (Chebyshev) UCL	384.5
95% Gamma Approximate UCL	1062		
95% Adjusted Gamma UCL	2063		

Note: DL/2 is not a recommended method.

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ACENAPHTHENE (ug/kg)

General Statistics

Number of Valid Samples	4	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	2
		Percent Non-Detects	50.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	121.5	Minimum Detected	4.8
Maximum Detected	140	Maximum Detected	4.942
Mean of Detected	130.8	Mean of Detected	4.871
SD of Detected	13.08	SD of Detected	0.1
Minimum Non-Detect	5.9	Minimum Non-Detect	1.775
Maximum Non-Detect	5.9	Maximum Non-Detect	1.775

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	66.85	Mean	2.976
SD	74.17	SD	2.188
95% DL/2 (t) UCL	154.1	95% H-Stat (DL/2) UCL	9.801E+12

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	0.359
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	N/A
Maximum	N/A
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
AppChi2	N/A
95% Gamma Approximate UCL	N/A
95% Adjusted Gamma UCL	N/A

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	126.1
SD	8.011
SE of Mean	5.664
95% KM (t) UCL	139.5
95% KM (z) UCL	135.4
95% KM (jackknife) UCL	144.3
95% KM (bootstrap t) UCL	126.1
95% KM (BCA) UCL	140
95% KM (Percentile Bootstrap) UCL	140
95% KM (Chebyshev) UCL	150.8
97.5% KM (Chebyshev) UCL	161.5
99% KM (Chebyshev) UCL	182.5
Potential UCLs to Use	
95% KM (t) UCL	139.5
95% KM (% Bootstrap) UCL	140

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

FLUORANTHENE (ug/kg)

General Statistics

Number of Valid Samples	4	Number of Unique Samples	4

Raw Statistics		**Log-transformed Statistics**	
Minimum	31	Minimum of Log Data	3.434
Maximum	234.5	Maximum of Log Data	5.457
Mean	97.88	Mean of log Data	4.271
Median	63	SD of log Data	0.888
SD	93.62		
Coefficient of Variation	0.957		
Skewness	1.699		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.813	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.748	Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	208	95% H-UCL	6408
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	267.4
95% Adjusted-CLT UCL	217.4	97.5% Chebyshev (MVUE) UCL	342.1
95% Modified-t UCL	214.7	99% Chebyshev (MVUE) UCL	488.9

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.603	Data appear Normal at 5% Significance Level	
Theta Star	162.3		
nu star	4.823		
Approximate Chi Square Value (.05)	1.071	**Nonparametric Statistics**	
Adjusted Level of Significance	N/A	95% CLT UCL	174.9
Adjusted Chi Square Value	N/A	95% Jackknife UCL	208
		95% Standard Bootstrap UCL	162.5
Anderson-Darling Test Statistic	0.352	95% Bootstrap-t UCL	850.9
Anderson-Darling 5% Critical Value	0.661	95% Hall's Bootstrap UCL	649.8
Kolmogorov-Smirnov Test Statistic	0.247	95% Percentile Bootstrap UCL	158.3
Kolmogorov-Smirnov 5% Critical Value	0.399	95% BCA Bootstrap UCL	186.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	301.9
		97.5% Chebyshev(Mean, Sd) UCL	390.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	563.6
95% Approximate Gamma UCL	440.6		
95% Adjusted Gamma UCL	N/A		
Potential UCL to Use		Use 95% Student's-t UCL	208

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NAPHTHALENE (ug/kg)

General Statistics

Number of Valid Samples	4	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	2
		Percent Non-Detects	50.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	44	Minimum Detected	3.784
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	82	Mean of Detected	4.286
SD of Detected	53.74	SD of Detected	0.709
Minimum Non-Detect	14	Minimum Non-Detect	2.639
Maximum Non-Detect	14	Maximum Non-Detect	2.639

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	44.5	Mean	3.116
SD	53.27	SD	1.412
95% DL/2 (t) UCL	107.2	95% H-Stat (DL/2) UCL	1738935

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Table C.9-6
EPC Calculation Results - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	0.359
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	N/A
Maximum	N/A
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
AppChi2	N/A
95% Gamma Approximate UCL	N/A
95% Adjusted Gamma UCL	N/A
Note: DL/2 is not a recommended method.	

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	63
SD	32.91
SE of Mean	23.27
95% KM (t) UCL	117.8
95% KM (z) UCL	101.3
95% KM (jackknife) UCL	137.5
95% KM (bootstrap t) UCL	63
95% KM (BCA) UCL	120
95% KM (Percentile Bootstrap) UCL	120
95% KM (Chebyshev) UCL	164.4
97.5% KM (Chebyshev) UCL	208.3
99% KM (Chebyshev) UCL	294.5
Potential UCLs to Use	
95% KM (t) UCL	117.8
95% KM (% Bootstrap) UCL	120

Table C.9-7
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Full Data Sets

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations			2000

ALUMINUM (mg/kg)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	18

Raw Statistics		**Log-transformed Statistics**	
Minimum	3460	Minimum of Log Data	8.149
Maximum	69000	Maximum of Log Data	11.14
Mean	28405	Mean of log Data	9.932
Median	32000	SD of log Data	0.951
SD	18526		
Coefficient of Variation	0.652		
Skewness	0.245		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Test Statistic	0.863
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	35775	95% H-UCL	57298
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	64205
95% Adjusted-CLT UCL	35651	97.5% Chebyshev (MVUE) UCL	78447
95% Modified-t UCL	35815	99% Chebyshev (MVUE) UCL	106423

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.464	Data appear Normal at 5% Significance Level	
Theta Star	19401		
nu star	55.63		
Approximate Chi Square Value (.05)	39.49	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	35396
Adjusted Chi Square Value	38.3	95% Jackknife UCL	35775
		95% Standard Bootstrap UCL	35259
Anderson-Darling Test Statistic	0.827	95% Bootstrap-t UCL	36182
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	35912
Kolmogorov-Smirnov Test Statistic	0.224	95% Percentile Bootstrap UCL	35438
Kolmogorov-Smirnov 5% Critical Value	0.202	95% BCA Bootstrap UCL	35528
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	46931
		97.5% Chebyshev(Mean, Sd) UCL	54947
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	70693
95% Approximate Gamma UCL	40014		
95% Adjusted Gamma UCL	41255		

Potential UCL to Use		Use 95% Student's-t UCL	35775

Table C.9-7
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ANTIMONY (mg/kg)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	15
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.036	Minimum of Log Data	-3.324
Maximum	16.4	Maximum of Log Data	2.797
Mean	1.16	Mean of log Data	-1.461
Median	0.24	SD of log Data	1.495
SD	3.706		
Coefficient of Variation	3.194		
Skewness	4.298		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.31	Shapiro Wilk Test Statistic	0.905
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.635	95% H-UCL	2.354
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.764
95% Adjusted-CLT UCL	3.455	97.5% Chebyshev (MVUE) UCL	2.252
95% Modified-t UCL	2.775	99% Chebyshev (MVUE) UCL	3.211
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.378	Data appear Lognormal at 5% Significance Level	
Theta Star	3.068		
nu star	14.37		
Approximate Chi Square Value (.05)	6.826	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	2.559
Adjusted Chi Square Value	6.375	95% Jackknife UCL	2.635
		95% Standard Bootstrap UCL	2.579
Anderson-Darling Test Statistic	2.323	95% Bootstrap-t UCL	19.06
Anderson-Darling 5% Critical Value	0.821	95% Hall's Bootstrap UCL	9.359
Kolmogorov-Smirnov Test Statistic	0.325	95% Percentile Bootstrap UCL	2.851
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	3.727
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.867
		97.5% Chebyshev(Mean, Sd) UCL	6.471
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.621
95% Approximate Gamma UCL	2.443		
95% Adjusted Gamma UCL	2.616		
Potential UCL to Use		Use 95% Chebyshev (MVUE) UCL	1.764

Table C.9-7
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC (mg/kg)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	18

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.32	Minimum of Log Data	-1.139
Maximum	16.1	Maximum of Log Data	2.779
Mean	6.009	Mean of log Data	1.4
Median	4.6	SD of log Data	1.022
SD	4.991		
Coefficient of Variation	0.831		
Skewness	1.11		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.848	Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	7.995	95% H-UCL	12.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.1
95% Adjusted-CLT UCL	8.204	97.5% Chebyshev (MVUE) UCL	17.35
95% Modified-t UCL	8.043	99% Chebyshev (MVUE) UCL	23.74

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.228	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4.894		
nu star	46.66		
Approximate Chi Square Value (.05)	31.98	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	7.892
Adjusted Chi Square Value	30.92	95% Jackknife UCL	7.995
		95% Standard Bootstrap UCL	7.819
Anderson-Darling Test Statistic	0.322	95% Bootstrap-t UCL	8.283
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	7.96
Kolmogorov-Smirnov Test Statistic	0.104	95% Percentile Bootstrap UCL	7.917
Kolmogorov-Smirnov 5% Critical Value	0.202	95% BCA Bootstrap UCL	8.142
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11
		97.5% Chebyshev(Mean, Sd) UCL	13.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.4
95% Approximate Gamma UCL	8.766		
95% Adjusted Gamma UCL	9.067		

Potential UCL to Use			
		Use 95% Approximate Gamma UCL	8.766

Table C.9-7
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM (mg/kg)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	16
Raw Statistics		**Log-transformed Statistics**	
Minimum	11	Minimum of Log Data	2.398
Maximum	66	Maximum of Log Data	4.19
Mean	41.78	Mean of log Data	3.578
Median	47	SD of log Data	0.639
SD	19.32		
Coefficient of Variation	0.462		
Skewness	-0.548		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.88	Shapiro Wilk Test Statistic	0.798
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	49.47	95% H-UCL	60.78
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	72.6
95% Adjusted-CLT UCL	48.48	97.5% Chebyshev (MVUE) UCL	85.25
95% Modified-t UCL	49.38	99% Chebyshev (MVUE) UCL	110.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.884	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.49		
nu star	109.6		
Approximate Chi Square Value (.05)	86.43	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	49.07
Adjusted Chi Square Value	84.63	95% Jackknife UCL	49.47
		95% Standard Bootstrap UCL	48.82
Anderson-Darling Test Statistic	1.38	95% Bootstrap-t UCL	48.85
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	48.31
Kolmogorov-Smirnov Test Statistic	0.272	95% Percentile Bootstrap UCL	49.09
Kolmogorov-Smirnov 5% Critical Value	0.2	95% BCA Bootstrap UCL	48.21
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	61.1
		97.5% Chebyshev(Mean, Sd) UCL	69.46
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	85.88
95% Approximate Gamma UCL	52.98		
95% Adjusted Gamma UCL	54.11		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	61.1

Table C.9-7
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT (mg/kg)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	2.65	Minimum of Log Data	0.975
Maximum	22	Maximum of Log Data	3.091
Mean	8.9	Mean of log Data	2.04
Median	8.4	SD of log Data	0.579
SD	4.794		
Coefficient of Variation	0.539		
Skewness	1.034		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.916	Shapiro Wilk Test Statistic	0.938
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.81	95% H-UCL	12.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.46
95% Adjusted-CLT UCL	10.99	97.5% Chebyshev (MVUE) UCL	16.82
95% Modified-t UCL	10.85	99% Chebyshev (MVUE) UCL	21.45
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.053	Data appear Normal at 5% Significance Level	
Theta Star	2.915		
nu star	116		
Approximate Chi Square Value (.05)	92.15	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	10.71
Adjusted Chi Square Value	90.29	95% Jackknife UCL	10.81
		95% Standard Bootstrap UCL	10.65
Anderson-Darling Test Statistic	0.437	95% Bootstrap-t UCL	11.2
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	11.48
Kolmogorov-Smirnov Test Statistic	0.178	95% Percentile Bootstrap UCL	10.84
Kolmogorov-Smirnov 5% Critical Value	0.2	95% BCA Bootstrap UCL	10.92
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.69
		97.5% Chebyshev(Mean, Sd) UCL	15.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.84
95% Approximate Gamma UCL	11.21		
95% Adjusted Gamma UCL	11.44		
Potential UCL to Use		Use 95% Student's-t UCL	10.81

Table C.9-7
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON (mg/kg)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	6730	Minimum of Log Data	8.814
Maximum	62000	Maximum of Log Data	11.03
Mean	32864	Mean of log Data	10.21
Median	36000	SD of log Data	0.707
SD	17426		
Coefficient of Variation	0.53		
Skewness	-0.129		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.94	Shapiro Wilk Test Statistic	0.871
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	39796	95% H-UCL	50517
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	60054
95% Adjusted-CLT UCL	39313	97.5% Chebyshev (MVUE) UCL	71223
95% Modified-t UCL	39776	99% Chebyshev (MVUE) UCL	93162
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.347	Data appear Normal at 5% Significance Level	
Theta Star	14000		
nu star	89.2		
Approximate Chi Square Value (.05)	68.43	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	39439
Adjusted Chi Square Value	66.84	95% Jackknife UCL	39796
		95% Standard Bootstrap UCL	39282
Anderson-Darling Test Statistic	0.794	95% Bootstrap-t UCL	39733
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	39270
Kolmogorov-Smirnov Test Statistic	0.181	95% Percentile Bootstrap UCL	39279
Kolmogorov-Smirnov 5% Critical Value	0.2	95% BCA Bootstrap UCL	39277
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	50290
		97.5% Chebyshev(Mean, Sd) UCL	57830
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	72641
95% Approximate Gamma UCL	42842		
95% Adjusted Gamma UCL	43861		
Potential UCL to Use		Use 95% Student's-t UCL	39796

Table C.9-7
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD (mg/kg)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	18
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.3	Minimum of Log Data	0.262
Maximum	366	Maximum of Log Data	5.903
Mean	42.04	Mean of log Data	2.838
Median	11.9	SD of log Data	1.259
SD	83.35		
Coefficient of Variation	1.983		
Skewness	3.648		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.477	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	75.2	95% H-UCL	92.32
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	86.53
95% Adjusted-CLT UCL	90.59	97.5% Chebyshev (MVUE) UCL	108.7
95% Modified-t UCL	77.87	99% Chebyshev (MVUE) UCL	152.3
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.603	Data appear Lognormal at 5% Significance Level	
Theta Star	69.68		
nu star	22.92		
Approximate Chi Square Value (.05)	13.03	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	73.49
Adjusted Chi Square Value	12.38	95% Jackknife UCL	75.2
		95% Standard Bootstrap UCL	72.35
Anderson-Darling Test Statistic	1.343	95% Bootstrap-t UCL	171.6
Anderson-Darling 5% Critical Value	0.786	95% Hall's Bootstrap UCL	186.6
Kolmogorov-Smirnov Test Statistic	0.236	95% Percentile Bootstrap UCL	76.75
Kolmogorov-Smirnov 5% Critical Value	0.207	95% BCA Bootstrap UCL	98.14
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	125.4
		97.5% Chebyshev(Mean, Sd) UCL	161.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	232.3
95% Approximate Gamma UCL	73.94		
95% Adjusted Gamma UCL	77.82		
Potential UCL to Use		Use 95% Chebyshev (MVUE) UCL	86.53

Table C.9-7
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE (mg/kg)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	83.7	Minimum of Log Data	4.427
Maximum	550	Maximum of Log Data	6.31
Mean	298.4	Mean of log Data	5.554
Median	330	SD of log Data	0.596
SD	143.7		
Coefficient of Variation	0.481		
Skewness	-0.109		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.934	Shapiro Wilk Test Statistic	0.885
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	355.6	95% H-UCL	414.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	495.6
95% Adjusted-CLT UCL	351.8	97.5% Chebyshev (MVUE) UCL	578.1
95% Modified-t UCL	355.4	99% Chebyshev (MVUE) UCL	740.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.077	Data appear Normal at 5% Significance Level	
Theta Star	97		
nu star	116.9		
Approximate Chi Square Value (.05)	92.95	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	352.6
Adjusted Chi Square Value	91.08	95% Jackknife UCL	355.6
		95% Standard Bootstrap UCL	351.5
Anderson-Darling Test Statistic	0.82	95% Bootstrap-t UCL	355.2
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	352
Kolmogorov-Smirnov Test Statistic	0.201	95% Percentile Bootstrap UCL	351.4
Kolmogorov-Smirnov 5% Critical Value	0.2	95% BCA Bootstrap UCL	347.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	442.1
		97.5% Chebyshev(Mean, Sd) UCL	504.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	626.4
95% Approximate Gamma UCL	375.4		
95% Adjusted Gamma UCL	383.1		
Potential UCL to Use		Use 95% Student's-t UCL	355.6

Table C.9-7
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

VANADIUM (mg/kg)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	11.6	Minimum of Log Data	2.451
Maximum	130	Maximum of Log Data	4.868
Mean	60.46	Mean of log Data	3.86
Median	67	SD of log Data	0.795
SD	35.52		
Coefficient of Variation	0.588		
Skewness	0.0245		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Test Statistic	0.864
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	74.59	95% H-UCL	101.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	118.6
95% Adjusted-CLT UCL	73.91	97.5% Chebyshev (MVUE) UCL	142.3
95% Modified-t UCL	74.59	99% Chebyshev (MVUE) UCL	188.9
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.906	Data appear Normal at 5% Significance Level	
Theta Star	31.71		
nu star	72.44		
Approximate Chi Square Value (.05)	53.85	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	73.86
Adjusted Chi Square Value	52.44	95% Jackknife UCL	74.59
		95% Standard Bootstrap UCL	73.53
Anderson-Darling Test Statistic	0.899	95% Bootstrap-t UCL	74.33
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	73.78
Kolmogorov-Smirnov Test Statistic	0.21	95% Percentile Bootstrap UCL	73.54
Kolmogorov-Smirnov 5% Critical Value	0.201	95% BCA Bootstrap UCL	73.26
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	95.98
		97.5% Chebyshev(Mean, Sd) UCL	111.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	141.5
95% Approximate Gamma UCL	81.34		
95% Adjusted Gamma UCL	83.51		
Potential UCL to Use		Use 95% Student's-t UCL	74.59

Table C.9-8
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

THALLIUM (mg/kg)

General Statistics

Number of Valid Samples	15	Number of Detected Data	12
Number of Unique Samples	11	Number of Non-Detect Data	3
		Percent Non-Detects	20.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.19	Minimum Detected	-1.661
Maximum Detected	0.59	Maximum Detected	-0.528
Mean of Detected	0.325	Mean of Detected	-1.175
SD of Detected	0.112	SD of Detected	0.33
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.28	Maximum Non-Detect	-1.273

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	8
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	53.33%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.91	Shapiro Wilk Test Statistic	0.961
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.286	Mean	-1.346
SD	0.128	SD	0.459
95% DL/2 (t) UCL	0.344	95% H-Stat (DL/2) UCL	0.356
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.406	Mean in Log Scale	-1.247
SD	0.0858	SD in Log Scale	0.329
95% MLE (t) UCL	0.445	Mean in Original Scale	0.303
95% MLE (Tiku) UCL	0.462	SD in Original Scale	0.109
		95% Percentile Bootstrap UCL	0.351
		95% BCA Bootstrap UCL	0.36

Table C.9-8
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	7.543
Theta Star	0.0431
nu star	181
A-D Test Statistic	0.292
5% A-D Critical Value	0.73
K-S Test Statistic	0.73
5% K-S Critical Value	0.245
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.19
Maximum	0.59
Mean	0.312
Median	0.285
SD	0.103
k star	9.105
Theta star	0.0343
Nu star	273.2
AppChi2	235.9
95% Gamma Approximate UCL	0.362
95% Adjusted Gamma UCL	0.369

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.303
SD	0.106
SE of Mean	0.0288
95% KM (t) UCL	0.354
95% KM (z) UCL	0.35
95% KM (jackknife) UCL	0.353
95% KM (bootstrap t) UCL	0.367
95% KM (BCA) UCL	0.355
95% KM (Percentile Bootstrap) UCL	0.352
95% KM (Chebyshev) UCL	0.429
97.5% KM (Chebyshev) UCL	0.483
99% KM (Chebyshev) UCL	0.59
Potential UCLs to Use	
95% KM (t) UCL	0.354
95% KM (Percentile Bootstrap) UCL	0.352

Table C.9-8
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR-1254 (ug/kg)

General Statistics

Number of Valid Samples	19	Number of Detected Data	9
Number of Unique Samples	9	Number of Non-Detect Data	10
		Percent Non-Detects	52.63%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	13	Minimum Detected	2.565
Maximum Detected	460	Maximum Detected	6.131
Mean of Detected	134.8	Mean of Detected	4.262
SD of Detected	155.6	SD of Detected	1.249
Minimum Non-Detect	8	Minimum Non-Detect	2.079
Maximum Non-Detect	9.2	Maximum Non-Detect	2.219

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	10
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	9
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	52.63%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.792	Shapiro Wilk Test Statistic	0.947
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	66.13	Mean	2.792
SD	123.5	SD	1.658
95% DL/2 (t) UCL	115.2	95% H-Stat (DL/2) UCL	120.3

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	2.342
		SD in Log Scale	2.11
		Mean in Original Scale	65.04
		SD in Original Scale	124
		95% Percentile Bootstrap UCL	113.8
		95% BCA Bootstrap UCL	131.4

Table C.9-8
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.681
Theta Star	197.9
nu star	12.26
A-D Test Statistic	0.351
5% A-D Critical Value	0.746
K-S Test Statistic	0.746
5% K-S Critical Value	0.288
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	13
Maximum	460
Mean	134.5
Median	129.3
SD	114.3
k star	1.265
Theta star	106.3
Nu star	48.08
AppChi2	33.16
95% Gamma Approximate UCL	195
95% Adjusted Gamma UCL	201.6

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	70.68
SD	117.9
SE of Mean	28.68
95% KM (t) UCL	120.4
95% KM (z) UCL	117.9
95% KM (jackknife) UCL	115.7
95% KM (bootstrap t) UCL	204.2
95% KM (BCA) UCL	134.8
95% KM (Percentile Bootstrap) UCL	125.3
95% KM (Chebyshev) UCL	195.7
97.5% KM (Chebyshev) UCL	249.8
99% KM (Chebyshev) UCL	356.1
Potential UCLs to Use	
95% KM (t) UCL	120.4

Table C.9-8
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

4-METHYL-2-PENTANONE (ug/kg)

General Statistics			
Number of Valid Samples	7	Number of Detected Data	4
Number of Unique Samples	4	Number of Non-Detect Data	3
		Percent Non-Detects	42.86%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2	Minimum Detected	0.693
Maximum Detected	16	Maximum Detected	2.773
Mean of Detected	9	Mean of Detected	1.818
SD of Detected	7.528	SD of Detected	1.078
Minimum Non-Detect	0.6	Minimum Non-Detect	-0.511
Maximum Non-Detect	0.8	Maximum Non-Detect	-0.223

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	3
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	42.86%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.796	Shapiro Wilk Test Statistic	0.828
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.293	Mean	0.586
SD	7.051	SD	1.717
95% DL/2 (t) UCL	10.47	95% H-Stat (DL/2) UCL	80.5
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	2.347	Mean in Log Scale	0.55
SD	9.852	SD in Log Scale	1.755
95% MLE (t) UCL	9.582	Mean in Original Scale	5.28
95% MLE (Tiku) UCL	10.68	SD in Original Scale	7.061
		95% Percentile Bootstrap UCL	9.52
		95% BCA Bootstrap UCL	9.76

Table C.9-8
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.532
Theta Star	16.9
nu star	4.26
A-D Test Statistic	0.543
5% A-D Critical Value	0.663
K-S Test Statistic	0.663
5% K-S Critical Value	0.4
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	2
Maximum	16
Mean	8
Median	6.667
SD	5.467
k star	1.439
Theta star	5.56
Nu star	20.14
AppChi2	10.96
95% Gamma Approximate UCL	14.71
95% Adjusted Gamma UCL	N/A

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	6
SD	6.024
SE of Mean	2.629
95% KM (t) UCL	11.11
95% KM (z) UCL	10.32
95% KM (jackknife) UCL	10.64
95% KM (bootstrap t) UCL	8.838
95% KM (BCA) UCL	15.29
95% KM (Percentile Bootstrap) UCL	15.29
95% KM (Chebyshev) UCL	17.46
97.5% KM (Chebyshev) UCL	22.42
99% KM (Chebyshev) UCL	32.16
Potential UCLs to Use	
95% KM (t) UCL	11.11
95% KM (Percentile Bootstrap) UCL	15.29

Table C.9-8
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

METHYLCYCLOHEXANE (ug/kg)

General Statistics

Number of Valid Samples	7	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	5
		Percent Non-Detects	71.43%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.9	Minimum Detected	-0.105
Maximum Detected	26.5	Maximum Detected	3.277
Mean of Detected	13.7	Mean of Detected	1.586
SD of Detected	18.1	SD of Detected	2.392
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.9	Maximum Non-Detect	-0.105

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	5
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	71.43%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	4.129	Mean	-0.427
SD	9.868	SD	1.699
95% DL/2 (t) UCL	11.38	95% H-Stat (DL/2) UCL	31.09

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Table C.9-8
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	0.355
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	N/A
Maximum	N/A
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
AppChi2	N/A
95% Gamma Approximate UCL	N/A
95% Adjusted Gamma UCL	N/A

Warning: Recommended UCL exceeds the maximum observation

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	4.557
SD	8.958
SE of Mean	4.788
95% KM (t) UCL	13.86
95% KM (z) UCL	12.43
95% KM (jackknife) UCL	23.65
95% KM (bootstrap t) UCL	1.8E+308
95% KM (BCA) UCL	26.5
95% KM (Percentile Bootstrap) UCL	26.5
95% KM (Chebyshev) UCL	25.43
97.5% KM (Chebyshev) UCL	34.46
99% KM (Chebyshev) UCL	52.2
Potential UCLs to Use	
99% KM (Chebyshev) UCL	52.2

Table C.9-8
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(A)PYRENE (ug/kg)

General Statistics

Number of Valid Samples	7	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	4
		Percent Non-Detects	57.14%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	5.4	Minimum Detected	1.686
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	48.47	Mean of Detected	3.157
SD of Detected	62.38	SD of Detected	1.557
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	1.6	Maximum Non-Detect	0.47

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.844	Shapiro Wilk Test Statistic	0.992
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	21.23	Mean	1.225
SD	44.12	SD	2.018
95% DL/2 (t) UCL	53.63	95% H-Stat (DL/2) UCL	4228
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.139
		SD in Log Scale	3.475
		Mean in Original Scale	20.88
		SD in Original Scale	44.3
		95% Percentile Bootstrap UCL	52.38
		95% BCA Bootstrap UCL	71.46

Table C.9-8
EPC Calculation Results - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	0.302
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	N/A
Maximum	N/A
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
AppChi2	N/A
95% Gamma Approximate UCL	N/A
95% Adjusted Gamma UCL	N/A

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	23.86
SD	39.57
SE of Mean	18.32
95% KM (t) UCL	59.45
95% KM (z) UCL	53.99
95% KM (jackknife) UCL	53.49
95% KM (bootstrap t) UCL	117.7
95% KM (BCA) UCL	120
95% KM (Percentile Bootstrap) UCL	120
95% KM (Chebyshev) UCL	103.7
97.5% KM (Chebyshev) UCL	138.3
99% KM (Chebyshev) UCL	206.1
Potential UCLs to Use	
95% KM (t) UCL	59.45
95% KM (Percentile Bootstrap) UCL	120

APPENDIX C.10

SOIL BACKGROUND EVALUATIONS

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Table C.10-1a
PROUCL 4.0 - Summary of Background vs Site Means Comparison - SWMU 40 - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	Site Data Distribution	Background Data Distibution*	Means Test for Comparison	Background Comparison Results (Y/N)
Aluminum	Normal	Non-parametric	Mann-Whitney	**Y**
Antimony	Non-parametric	--	--	--
Arsenic	Non-parametric	Non-parametric	Mann-Whitney	N
Barium	Gamma	Normal	Mann-Whitney	N
Beryllium	Gamma	Normal	Mann-Whitney	N
Cadmium	Non-parametric	--	--	--
Calcium	Gamma	Normal	Mann-Whitney	**Y**
Chromium	Normal	Normal	Paired-t test	N
Cobalt	Normal	Normal	Mann-Whitney	N
Copper	Gamma	Non-parametric	Mann-Whitney	N
Iron	Non-parametric	Non-parametric	Mann-Whitney	N
Lead	Non-parametric	Non-parametric	Mann-Whitney	N
Magnesium	Gamma	Non-parametric	Mann-Whitney	**Y**
Manganese	Normal	Non-parametric	Mann-Whitney	N
Mercury	Non-parametric	--	--	--
Nickel	Gamma	Normal	Mann-Whitney	N
Potassium	Gamma	Non-parametric	Mann-Whitney	N
Selenium	Gamma	--	--	--
Silver	Normal	--	--	--
Sodium	Normal	--	--	--
Thallium	--	--	--	--
Vanadium	Non-parametric	Normal	Mann-Whitney	N
Zinc	Normal	Non-parametric	Mann-Whitney	N

Notes:
* Background distibution noted is for data with outliers removed
-- = Insufficient Detections to Determine Distribution
N = Site <= Background
Y = Site > Background

Table C.10-1b
PROUCL 4.0 - Summary of Background vs Site Means Comparison - SWMU 40 - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	Site Data Distribution	Background Data Distibution*	Means Test for Comparison	Background Comparison Results (Y/N)
Aluminum	Non-parametric	Non-parametric	Mann-Whitney	**Y**
Antimony	Non-parametric	--	--	--
Arsenic	Non-parametric	Non-parametric	Mann-Whitney	**Y**
Barium	Gamma	Non-parametric	Mann-Whitney	**Y**
Beryllium	Non-parametric	Normal	Mann-Whitney	**Y**
Cadmium	Non-parametric	Non-parametric	Mann-Whitney	**Y**
Calcium	Non-parametric	Normal	Mann-Whitney	**Y**
Chromium	Non-parametric	Normal	Mann-Whitney	N
Cobalt	Non-parametric	Non-parametric	Mann-Whitney	N
Copper	Non-parametric	Non-parametric	Mann-Whitney	N
Iron	Non-parametric	Normal	Mann-Whitney	N
Lead	Non-parametric	Non-parametric	Mann-Whitney	N
Magnesium	Gamma	Non-parametric	Mann-Whitney	**Y**
Manganese	Normal	Non-parametric	Mann-Whitney	N
Mercury	Non-parametric	Normal	Mann-Whitney	**Y**
Nickel	Gamma	Non-parametric	Mann-Whitney	**Y**
Potassium	Gamma	Non-parametric	Mann-Whitney	**Y**
Selenium	Non-parametric	--	--	--
Silver	Non-parametric	--	--	--
Sodium	Non-parametric	--	--	--
Thallium	Non-parametric	Normal	Mann-Whitney	N
Vanadium	Normal	Normal	Paired-t Test	N
Zinc	Non-parametric	Non-parametric	Mann-Whitney	**Y**

Notes:
* Background distibution noted is for data with outliers removed
-- = Insufficient Detections to Determine Distribution
N = Site <= Background
Y = Site > Background

Table C.10-1c
PROUCL 4.0 - Summary of Background vs Site Means Comparison - SWMU 71 - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	Site Data Distribution	Background Data Distibution*	Means Test for Comparison	Background Comparison Results (Y/N)
Aluminum	Non-parametric	Non-parametric	Mann-Whitney	N
Antimony	Non-parametric	--	--	--
Arsenic	Normal	Non-parametric	Mann-Whitney	**Y**
Barium	Normal	Normal	Mann-Whitney	N
Beryllium	Normal	Normal	Mann-Whitney	N
Cadmium	Normal	--	--	--
Calcium	Non-parametric	Normal	Mann-Whitney	**Y**
Chromium	Normal	Normal	Paired T-test	N
Cobalt	Non-parametric	Normal	Mann-Whitney	N
Copper	Normal	Non-parametric	Mann-Whitney	**Y**
Iron	Non-parametric	Non-parametric	Mann-Whitney	N
Lead	Non-parametric	Non-parametric	Mann-Whitney	N
Magnesium	Normal	Non-parametric	Mann-Whitney	**Y**
Manganese	Non-parametric	Non-parametric	Mann-Whitney	N
Mercury	Normal	--	--	--
Nickel	Normal	Normal	Paired T-test	N
Potassium	Non-parametric	Non-parametric	Mann-Whitney	N
Selenium	Normal	--	--	--
Silver	Non-parametric	--	--	--
Sodium	Normal	--	--	--
Thallium	Normal	--	--	--
Vanadium	Non-parametric	Normal	Mann-Whitney	N
Zinc	Normal	Non-parametric	Mann-Whitney	N

Notes:
* Background distibution noted is for data with outliers removed
-- = Insufficient Detections to Determine Distribution
N = Site <= Background
Y = Site > Background

Table C.10-1d
PROUCL 4.0 - Summary of Background vs Site Means Comparison - SWMU 71 - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	Site Data Distribution	Background Data Distibution*	Means Test for Comparison	Background Comparison Results (Y/N)
Aluminum	Normal	Non-parametric	Mann-Whitney	N
Antimony	Non-parametric	--	--	--
Arsenic	Non-parametric	Non-parametric	Mann-Whitney	N
Barium	Normal	Non-parametric	Mann-Whitney	N
Beryllium	Normal	Normal	Mann-Whitney	N
Cadmium	Non-parametric	Non-parametric	Mann-Whitney	N
Calcium	Non-parametric	Normal	Mann-Whitney	**Y**
Chromium	Non-parametric	Normal	Mann-Whitney	N
Cobalt	Non-parametric	Non-parametric	Mann-Whitney	N
Copper	Normal	Non-parametric	Mann-Whitney	N
Iron	Normal	Normal	Paired T-test	N
Lead	Non-parametric	Non-parametric	Mann-Whitney	N
Magnesium	Normal	Non-parametric	Mann-Whitney	**Y**
Manganese	Normal	Non-parametric	Mann-Whitney	N
Mercury	Non-parametric	Normal	Mann-Whitney	N
Nickel	Non-parametric	Non-parametric	Mann-Whitney	N
Potassium	Normal	Non-parametric	Mann-Whitney	N
Selenium	Non-parametric	--	--	--
Silver	Non-parametric	--	--	--
Sodium	Normal	--	--	--
Thallium	Normal	Normal	Mann-Whitney	N
Vanadium	Normal	Normal	Paired T-test	N
Zinc	Non-parametric	Non-parametric	Mann-Whitney	N

Notes:
* Background distibution noted is for data with outliers removed
-- = Insufficient Detections to Determine Distribution
N = Site <= Background
Y = Site > Background

Table C.10-2a
Background Data Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Chromium

Raw Statistics

Number of Valid Samples	27
Number of Unique Samples	26
Minimum	6.3
Maximum	34.4
Mean of Raw Data	19.9
Standard Deviation of Raw Data	8.556
Kstar	4.308
Mean of Log Transformed Data	2.883
Standard Deviation of Log Transformed Data	0.497

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.928
Shapiro Wilk Critical (0.95) Value	0.923
Lilliefors Test Statistic	0.14
Lilliefors Critical (0.95) Value	0.171

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.898
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.176
K-S Critical(0.95) Value	0.169

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical (0.95) Value	0.923
Lilliefors Test Statistic	0.191
Lilliefors Critical (0.95) Value	0.171

Data not Lognormal at (0.05) Significance Level

Table C.10-2a
Background Data Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Iron

Raw Statistics

Number of Valid Samples	27
Number of Unique Samples	25
Minimum	7250
Maximum	33700
Mean of Raw Data	18519
Standard Deviation of Raw Data	8539
Kstar	3.889
Mean of Log Transformed Data	9.707
Standard Deviation of Log Transformed Data	0.52

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical (0.95) Value	0.923
Lilliefors Test Statistic	0.171
Lilliefors Critical (0.95) Value	0.171

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.872
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.17
K-S Critical(0.95) Value	0.169

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.893
Shapiro Wilk Critical (0.95) Value	0.923
Lilliefors Test Statistic	0.181
Lilliefors Critical (0.95) Value	0.171

Data not Lognormal at (0.05) Significance Level

Table C.10-2a
Background Data Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Lead

Raw Statistics

Number of Valid Samples	25
Number of Unique Samples	23
Minimum	8.9
Maximum	28.8
Mean of Raw Data	16.05
Standard Deviation of Raw Data	5.967
Kstar	7.372
Mean of Log Transformed Data	2.714
Standard Deviation of Log Transformed Data	0.351

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.885
Shapiro Wilk Critical (0.95) Value	0.918
Lilliefors Test Statistic	0.183
Lilliefors Critical (0.95) Value	0.177

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.642
A-D Critical (0.95) Value	0.746
K-S Test Statistic	0.141
K-S Critical(0.95) Value	0.175

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical (0.95) Value	0.918
Lilliefors Test Statistic	0.117
Lilliefors Critical (0.95) Value	0.177

Data appear Lognormal at (0.05) Significance Level

Table C.10-2a
Background Data Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Vanadium

Raw Statistics

Number of Valid Samples	27
Number of Unique Samples	26
Minimum	12.2
Maximum	52.9
Mean of Raw Data	31.4
Standard Deviation of Raw Data	12.19
Kstar	5.29
Mean of Log Transformed Data	3.36
Standard Deviation of Log Transformed Data	0.445

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical (0.95) Value	0.923
Lilliefors Test Statistic	0.123
Lilliefors Critical (0.95) Value	0.171

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.913
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.144
K-S Critical(0.95) Value	0.168

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical (0.95) Value	0.923
Lilliefors Test Statistic	0.167
Lilliefors Critical (0.95) Value	0.171

Data not Lognormal at (0.05) Significance Level

Table C.10-2a
Background Data Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Zinc

Raw Statistics

Number of Valid Samples	27
Number of Unique Samples	27
Minimum	7.1
Maximum	94.1
Mean of Raw Data	34.74
Standard Deviation of Raw Data	21.52
Kstar	2.389
Mean of Log Transformed Data	3.348
Standard Deviation of Log Transformed Data	0.67

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical (0.95) Value	0.923
Lilliefors Test Statistic	0.139
Lilliefors Critical (0.95) Value	0.171

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.39
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.139
K-S Critical(0.95) Value	0.17

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical (0.95) Value	0.923
Lilliefors Test Statistic	0.133
Lilliefors Critical (0.95) Value	0.171

Data appear Lognormal at (0.05) Significance Level

Table C.10-2b
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Calcium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Calcium Data	27	0	27	22	5	18.52%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	5	4.6	6.6	5.12	4.8	0.844
Statistics (Detects Only)	22	116	2200	917.5	855	540.4
Statistics (All: NDs treated as DL value)	27	4.6	2200	748.5	715	605.2
Statistics (All: NDs treated as DL/2 value)	27	2.3	2200	748	715	605.8
Statistics (Normal ROS Estimated Data)	27	-475.6	2200	688.2	715	691
Statistics (Gamma ROS Estimated Data)	27	37.46	2200	779.4	715	569.4
Statistics (Lognormal ROS Estimated Data)	27	116	2200	777.8	715	570.1

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	2.645	2.376	346.9	6.621	0.708	0.107
Statistics (NDs = DL)	0.66	0.612	1133	5.695	2.079	0.365
Statistics (NDs = DL/2)	0.59	0.549	1268	5.567	2.342	0.421
Statistics (Gamma ROS Estimates)	1.597	1.445	487.9	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.337	0.881	0.139

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.955	0.911	Data Appear Normal
Lilliefors (Detects Only)	0.134	0.189	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.937	0.923	Data Appear Normal
Lilliefors (NDs = DL)	0.11	0.171	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.937	0.923	Data Appear Normal
Lilliefors (NDs = DL/2)	0.109	0.171	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.974	0.923	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0825	0.171	Data Appear Normal

Table C.10-2b
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.178	0.752	
Kolmogorov-Smirnov (Detects Only)	0.0934	0.187	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.711	0.792	
Kolmogorov-Smirnov (NDs = DL)	0.221	0.176	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.01	0.799	
Kolmogorov-Smirnov (NDs = DL/2)	0.241	0.177	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.228	0.762	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.104	0.171	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.95	0.911	Data Appear Lognormal
Lilliefors (Detects Only)	0.132	0.189	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.733	0.923	Data Not Lognormal
Lilliefors (NDs = DL)	0.292	0.171	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.707	0.923	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.308	0.171	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.933	0.923	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.139	0.171	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2b
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Cobalt

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Cobalt Data	27	0	27	19	8	29.63%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	0.11	0.75	0.501	0.72	0.319
Statistics (Detects Only)	19	5.9	33.6	14.39	11.9	7.506
Statistics (All: NDs treated as DL value)	27	0.11	33.6	10.28	10.1	8.99
Statistics (All: NDs treated as DL/2 value)	27	0.055	33.6	10.2	10.1	9.073
Statistics (Normal ROS Estimated Data)	27	-5.603	33.6	9.253	10.1	10.26
Statistics (Gamma ROS Estimated Data)	27	4.96	33.6	12.4	10.11	7.056
Statistics (Lognormal ROS Estimated Data)	27	3.487	33.6	11.37	10.1	7.855

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	4.578	4.094	3.144	2.554	0.479	0.187
Statistics (NDs = DL)	0.725	0.669	14.18	1.5	1.772	1.181
Statistics (NDs = DL/2)	0.601	0.559	16.98	1.295	2.076	1.603
Statistics (Gamma ROS Estimates)	4.118	3.685	3.012	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.218	0.663	0.299

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.869	0.901	Data Not Normal
Lilliefors (Detects Only)	0.2	0.203	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.903	0.923	Data Not Normal
Lilliefors (NDs = DL)	0.152	0.171	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.9	0.923	Data Not Normal
Lilliefors (NDs = DL/2)	0.157	0.171	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.944	0.923	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.128	0.171	Data Appear Normal

Table C.10-2b
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.449	0.744	
Kolmogorov-Smirnov (Detects Only)	0.148	0.199	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.337	0.786	
Kolmogorov-Smirnov (NDs = DL)	0.212	0.175	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.735	0.798	
Kolmogorov-Smirnov (NDs = DL/2)	0.235	0.177	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.776	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.145	0.169	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.967	0.901	Data Appear Lognormal
Lilliefors (Detects Only)	0.116	0.203	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.816	0.923	Data Not Lognormal
Lilliefors (NDs = DL)	0.265	0.171	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.789	0.923	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.295	0.171	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.948	0.923	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.13	0.171	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2b
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Magnesium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Magnesium Data	27	0	27	24	3	11.11%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	4.7	5	4.833	4.8	0.153
Statistics (Detects Only)	24	158	8080	1752	852.5	2254
Statistics (All: NDs treated as DL value)	27	4.7	8080	1558	690	2193
Statistics (All: NDs treated as DL/2 value)	27	2.35	8080	1557	690	2193
Statistics (Normal ROS Estimated Data)	27	-2751	8080	1251	690	2564
Statistics (Gamma ROS Estimated Data)	27	0	8080	1557	690	2193
Statistics (Lognormal ROS Estimated Data)	27	67.74	8080	1565	690	2188

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.91	0.834	1925	6.827	1.135	0.166
Statistics (NDs = DL)	0.563	0.525	2766	6.243	1.992	0.319
Statistics (NDs = DL/2)	0.531	0.497	2931	6.166	2.183	0.354
Statistics (Gamma ROS Estimates)	0.205	0.207	7611	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.537	1.356	0.207

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.685	0.916	Data Not Normal
Lilliefors (Detects Only)	0.265	0.181	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.676	0.923	Data Not Normal
Lilliefors (NDs = DL)	0.264	0.171	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.677	0.923	Data Not Normal
Lilliefors (NDs = DL/2)	0.264	0.171	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.832	0.923	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.224	0.171	Data Not Normal

Table C.10-2b
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.91	0.776	
Kolmogorov-Smirnov (Detects Only)	0.149	0.184	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	0.489	0.801	
Kolmogorov-Smirnov (NDs = DL)	0.131	0.177	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.545	0.804	
Kolmogorov-Smirnov (NDs = DL/2)	0.146	0.178	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.472	0.894	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.39	0.186	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.95	0.916	Data Appear Lognormal
Lilliefors (Detects Only)	0.113	0.181	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.859	0.923	Data Not Lognormal
Lilliefors (NDs = DL)	0.208	0.171	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.824	0.923	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.234	0.171	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.965	0.923	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0762	0.171	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Aluminum

Raw Statistics

Number of Valid Samples	76
Number of Unique Samples	72
Minimum	3620
Maximum	33900
Mean of Raw Data	12977
Standard Deviation of Raw Data	7223
Kstar	3.302
Mean of Log Transformed Data	9.318
Standard Deviation of Log Transformed Data	0.567

Normal Distribution Test Results

Lilliefors Test Statistic	0.123
Lilliefors Critical (0.95) Value	0.102

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.425
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.0786
K-S Critical(0.95) Value	0.103

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.0677
Lilliefors Critical (0.95) Value	0.102

Data appear Lognormal at (0.05) Significance Level

Table C.10-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chromium

Raw Statistics

Number of Valid Samples	78
Number of Unique Samples	69
Minimum	6.3
Maximum	53.3
Mean of Raw Data	26.24
Standard Deviation of Raw Data	11.28
Kstar	4.736
Mean of Log Transformed Data	3.162
Standard Deviation of Log Transformed Data	0.486

Normal Distribution Test Results

Lilliefors Test Statistic	0.069
Lilliefors Critical (0.95) Value	0.1

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.746
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.101
K-S Critical(0.95) Value	0.101

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.13
Lilliefors Critical (0.95) Value	0.1

Data not Lognormal at (0.05) Significance Level

Table C.10-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Iron

Raw Statistics

Number of Valid Samples	78
Number of Unique Samples	71
Minimum	7250
Maximum	63000
Mean of Raw Data	26441
Standard Deviation of Raw Data	11126
Kstar	4.694
Mean of Log Transformed Data	10.08
Standard Deviation of Log Transformed Data	0.497

Normal Distribution Test Results

Lilliefors Test Statistic	0.0572
Lilliefors Critical (0.95) Value	0.1

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.007
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.0899
K-S Critical(0.95) Value	0.101

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.12
Lilliefors Critical (0.95) Value	0.1

Data not Lognormal at (0.05) Significance Level

Table C.10-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Manganese

Raw Statistics

Number of Valid Samples	73
Number of Unique Samples	72
Minimum	16.7
Maximum	1110
Mean of Raw Data	362.1
Standard Deviation of Raw Data	273.1
Kstar	1.357
Mean of Log Transformed Data	5.496
Standard Deviation of Log Transformed Data	1.023

Normal Distribution Test Results

Lilliefors Test Statistic	0.113
Lilliefors Critical (0.95) Value	0.104

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.639
A-D Critical (0.95) Value	0.772
K-S Test Statistic	0.0738
K-S Critical(0.95) Value	0.107

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.118
Lilliefors Critical (0.95) Value	0.104

Data not Lognormal at (0.05) Significance Level

Table C.10-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Lead

Raw Statistics

Number of Valid Samples	74
Number of Unique Samples	65
Minimum	2.1
Maximum	35.5
Mean of Raw Data	13.35
Standard Deviation of Raw Data	6.983
Kstar	3.951
Mean of Log Transformed Data	2.465
Standard Deviation of Log Transformed Data	0.515

Normal Distribution Test Results

Lilliefors Test Statistic	0.15
Lilliefors Critical (0.95) Value	0.103

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.748
A-D Critical (0.95) Value	0.756
K-S Test Statistic	0.084
K-S Critical(0.95) Value	0.104

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.0575
Lilliefors Critical (0.95) Value	0.103

Data appear Lognormal at (0.05) Significance Level

Table C.10-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Vanadium

Raw Statistics

Number of Valid Samples	78
Number of Unique Samples	75
Minimum	12.2
Maximum	101
Mean of Raw Data	44.97
Standard Deviation of Raw Data	18.97
Kstar	5.086
Mean of Log Transformed Data	3.708
Standard Deviation of Log Transformed Data	0.466

Normal Distribution Test Results

Lilliefors Test Statistic	0.0902
Lilliefors Critical (0.95) Value	0.1

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.29
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.059
K-S Critical(0.95) Value	0.101

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.0891
Lilliefors Critical (0.95) Value	0.1

Data appear Lognormal at (0.05) Significance Level

Table C.10-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Zinc

Raw Statistics

Number of Valid Samples	74
Number of Unique Samples	71
Minimum	4.7
Maximum	96
Mean of Raw Data	35.22
Standard Deviation of Raw Data	23.62
Kstar	2.164
Mean of Log Transformed Data	3.323
Standard Deviation of Log Transformed Data	0.727

Normal Distribution Test Results

Lilliefors Test Statistic	0.15
Lilliefors Critical (0.95) Value	0.103

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.602
A-D Critical (0.95) Value	0.762
K-S Test Statistic	0.0952
K-S Critical(0.95) Value	0.105

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.0963
Lilliefors Critical (0.95) Value	0.103

Data appear Lognormal at (0.05) Significance Level

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Arsenic

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Arsenic Data	69	0	69	66	3	4.35%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.09	0.12	0.103	0.1	0.0153
Statistics (Detects Only)	66	1.2	7.6	3.276	2.9	1.484
Statistics (All: NDs treated as DL value)	69	0.09	7.6	3.138	2.8	1.591
Statistics (All: NDs treated as DL/2 value)	69	0.045	7.6	3.136	2.8	1.595
Statistics (Normal ROS Estimated Data)	69	-0.154	7.6	3.127	2.8	1.613
Statistics (Gamma ROS Estimated Data)	69	0.0978	7.6	3.138	2.8	1.591
Statistics (Lognormal ROS Estimated Data)	69	1.077	7.6	3.18	2.8	1.52

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	5.637	5.402	0.581	1.095	0.427	0.39
Statistics (NDs = DL)	2.72	2.612	1.153	0.949	0.809	0.853
Statistics (NDs = DL/2)	2.382	2.288	1.316	0.918	0.934	1.017
Statistics (Gamma ROS Estimates)	2.694	2.587	1.165	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.051	0.467	0.444

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.126	0.109	Data Not Normal
Lilliefors (NDs = DL)	0.106	0.107	Data Appear Normal
Lilliefors (NDs = DL/2)	0.105	0.107	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.102	0.107	Data Appear Normal

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.51	0.753	
Kolmogorov-Smirnov (Detects Only)	0.0872	0.11	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.005	0.759	
Kolmogorov-Smirnov (NDs = DL)	0.135	0.108	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.744	0.761	
Kolmogorov-Smirnov (NDs = DL/2)	0.158	0.108	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.078	0.759	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.136	0.108	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.0611	0.109	Data Appear Lognormal
Lilliefors (NDs = DL)	0.197	0.107	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.231	0.107	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0458	0.107	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Beryllium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Beryllium Data	71	0	71	32	39	54.93%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	39	0.022	0.03	0.0286	0.03	0.00265
Statistics (Detects Only)	32	0.61	1.6	1.017	0.975	0.272
Statistics (All: NDs treated as DL value)	71	0.022	1.6	0.474	0.03	0.527
Statistics (All: NDs treated as DL/2 value)	71	0.011	1.6	0.466	0.015	0.534
Statistics (Normal ROS Estimated Data)	71	-0.475	1.6	0.59	0.557	0.472
Statistics (Gamma ROS Estimated Data)	71	0.61	1.6	1.031	1.052	0.198
Statistics (Lognormal ROS Estimated Data)	71	0.233	1.6	0.721	0.617	0.335

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	14.61	14	0.0696	-0.0179	0.268	-15
Statistics (NDs = DL)	0.519	0.507	0.913	-1.962	1.784	-0.909
Statistics (NDs = DL/2)	0.414	0.406	1.125	-2.343	2.13	-0.909
Statistics (Gamma ROS Estimates)	26.7	25.58	0.0386	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.429	0.456	-1.063

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.953	0.93	Data Appear Normal
Lilliefors (Detects Only)	0.118	0.157	Data Appear Normal
Lilliefors (NDs = DL)	0.349	0.105	Data Not Normal
Lilliefors (NDs = DL/2)	0.35	0.105	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0495	0.105	Data Appear Normal

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.268	0.746	
Kolmogorov-Smirnov (Detects Only)	0.0843	0.155	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	8.979	0.815	
Kolmogorov-Smirnov (NDs = DL)	0.36	0.112	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.326	0.838	
Kolmogorov-Smirnov (NDs = DL/2)	0.361	0.113	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.819	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0939	0.105	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.967	0.93	Data Appear Lognormal
Lilliefors (Detects Only)	0.0849	0.157	Data Appear Lognormal
Lilliefors (NDs = DL)	0.356	0.105	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.358	0.105	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0725	0.105	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Cadmium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Cadmium Data	78	0	78	12	66	84.62%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	66	0.02	0.05	0.0256	0.02	0.00861
Statistics (Detects Only)	12	0.57	2.2	1.04	1.01	0.441
Statistics (All: NDs treated as DL value)	78	0.02	2.2	0.182	0.02	0.404
Statistics (All: NDs treated as DL/2 value)	78	0.01	2.2	0.171	0.01	0.409
Statistics (Normal ROS Estimated Data)	78	-3.035	2.2	-0.653	-0.759	1.021
Statistics (Gamma ROS Estimated Data)	78	0.316	2.418	1.666	1.826	0.535
Statistics (Lognormal ROS Estimated Data)	78	0.0273	2.2	0.333	0.201	0.364

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	7.344	7.07	0.142	-0.0304	0.379	-12.45
Statistics (NDs = DL)	0.449	0.44	0.405	-3.144	1.371	-0.436
Statistics (NDs = DL/2)	0.343	0.339	0.497	-3.731	1.617	-0.433
Statistics (Gamma ROS Estimates)	7.328	7.055	0.227	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.514	0.894	-0.591

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.842	0.859	Data Not Normal
Lilliefors (Detects Only)	0.194	0.256	Data Appear Normal
Lilliefors (NDs = DL)	0.474	0.1	Data Not Normal
Lilliefors (NDs = DL/2)	0.486	0.1	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0691	0.1	Data Appear Normal

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.349	0.731	
Kolmogorov-Smirnov (Detects Only)	0.144	0.246	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	17.48	0.83	
Kolmogorov-Smirnov (NDs = DL)	0.421	0.108	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	18.46	0.855	
Kolmogorov-Smirnov (NDs = DL/2)	0.45	0.109	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.663	0.753	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.161	0.101	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.949	0.859	Data Appear Lognormal
Lilliefors (Detects Only)	0.136	0.256	Data Appear Lognormal
Lilliefors (NDs = DL)	0.324	0.1	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.346	0.1	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0692	0.1	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Calcium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Calcium Data	75	0	75	59	16	21.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	16	4.6	6.7	5.563	5.4	0.796
Statistics (Detects Only)	59	116	2200	774.2	709	497.4
Statistics (All: NDs treated as DL value)	75	4.6	2200	610.2	527	542.6
Statistics (All: NDs treated as DL/2 value)	75	2.3	2200	609.6	527	543.2
Statistics (Normal ROS Estimated Data)	75	-568.5	2200	538.9	527	635.2
Statistics (Gamma ROS Estimated Data)	75	0	2200	642.2	527	510.9
Statistics (Lognormal ROS Estimated Data)	75	95.26	2200	637.7	527	513.4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	2.382	2.295	325	6.427	0.716	0.111
Statistics (NDs = DL)	0.619	0.603	985.7	5.42	2.048	0.378
Statistics (NDs = DL/2)	0.549	0.536	1110	5.272	2.322	0.44
Statistics (Gamma ROS Estimates)	0.816	0.793	786.6	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.1	0.899	0.147

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.112	0.115	Data Appear Normal
Lilliefors (NDs = DL)	0.132	0.102	Data Not Normal
Lilliefors (NDs = DL/2)	0.132	0.102	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0772	0.102	Data Appear Normal

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.273	0.761	
Kolmogorov-Smirnov (Detects Only)	0.0608	0.117	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.687	0.806	
Kolmogorov-Smirnov (NDs = DL)	0.163	0.108	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.498	0.813	
Kolmogorov-Smirnov (NDs = DL/2)	0.181	0.109	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.631	0.79	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.172	0.107	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.0862	0.115	Data Appear Lognormal
Lilliefors (NDs = DL)	0.244	0.102	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.27	0.102	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.114	0.102	Data Not Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Cobalt

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Cobalt Data	74	0	74	51	23	31.08%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	23	0.11	0.84	0.587	0.73	0.286
Statistics (Detects Only)	51	5.9	41.1	15.67	12.9	8.18
Statistics (All: NDs treated as DL value)	74	0.11	41.1	10.98	10.25	9.76
Statistics (All: NDs treated as DL/2 value)	74	0.055	41.1	10.89	10.25	9.858
Statistics (Normal ROS Estimated Data)	74	-10.12	41.1	9.844	10.25	11.19
Statistics (Gamma ROS Estimated Data)	74	1.705	41.1	13.62	11.95	7.663
Statistics (Lognormal ROS Estimated Data)	74	2.997	41.1	12.24	10.25	8.514

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	4.404	4.234	3.558	2.634	0.482	0.183
Statistics (NDs = DL)	0.733	0.712	14.99	1.577	1.697	1.076
Statistics (NDs = DL/2)	0.602	0.586	18.11	1.361	2.002	1.471
Statistics (Gamma ROS Estimates)	3.595	3.458	3.788	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.287	0.664	0.29

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.178	0.124	Data Not Normal
Lilliefors (NDs = DL)	0.161	0.103	Data Not Normal
Lilliefors (NDs = DL/2)	0.167	0.103	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.098	0.103	Data Appear Normal

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.658	0.754	
Kolmogorov-Smirnov (Detects Only)	0.132	0.125	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	3.324	0.795	
Kolmogorov-Smirnov (NDs = DL)	0.182	0.108	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.416	0.808	
Kolmogorov-Smirnov (NDs = DL/2)	0.199	0.109	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.23	0.757	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.12	0.104	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.101	0.124	Data Appear Lognormal
Lilliefors (NDs = DL)	0.236	0.103	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.271	0.103	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.099	0.103	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Magnesium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Magnesium Data	70	0	70	63	7	10.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	7	3.8	5	4.686	4.8	0.402
Statistics (Detects Only)	63	139	9200	2102	971	2335
Statistics (All: NDs treated as DL value)	70	3.8	9200	1893	826	2302
Statistics (All: NDs treated as DL/2 value)	70	1.9	9200	1892	826	2302
Statistics (Normal ROS Estimated Data)	70	-3596	9200	1612	826	2666
Statistics (Gamma ROS Estimated Data)	70	0	9200	1892	826	2302
Statistics (Lognormal ROS Estimated Data)	70	53.89	9200	1900	826	2296

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.93	0.9	2260	7.025	1.165	0.166
Statistics (NDs = DL)	0.581	0.565	3259	6.477	1.991	0.307
Statistics (NDs = DL/2)	0.55	0.536	3441	6.407	2.169	0.338
Statistics (Gamma ROS Estimates)	0.22	0.22	8600	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.764	1.359	0.201

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.232	0.112	Data Not Normal
Lilliefors (NDs = DL)	0.237	0.106	Data Not Normal
Lilliefors (NDs = DL/2)	0.237	0.106	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.19	0.106	Data Not Normal

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.664	0.783	
Kolmogorov-Smirnov (Detects Only)	0.125	0.116	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.862	0.809	
Kolmogorov-Smirnov (NDs = DL)	0.0996	0.112	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	1.008	0.812	
Kolmogorov-Smirnov (NDs = DL/2)	0.113	0.112	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.77	0.901	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.358	0.117	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.0872	0.112	Data Appear Lognormal
Lilliefors (NDs = DL)	0.164	0.106	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.191	0.106	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0712	0.106	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Mercury

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Mercury Data	78	0	78	17	61	78.21%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	61	0.019	0.06	0.0484	0.06	0.0158
Statistics (Detects Only)	17	0.038	0.27	0.127	0.12	0.0561
Statistics (All: NDs treated as DL value)	78	0.019	0.27	0.0655	0.06	0.0437
Statistics (All: NDs treated as DL/2 value)	78	0.0095	0.27	0.0466	0.03	0.0502
Statistics (Normal ROS Estimated Data)	78	-0.295	0.27	-0.0401	-0.0453	0.118
Statistics (Gamma ROS Estimated Data)	78	0.038	0.27	0.125	0.123	0.0281
Statistics (Lognormal ROS Estimated Data)	78	0.00362	0.27	0.0468	0.028	0.0514

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	5.112	4.924	0.0248	-2.165	0.487	-0.225
Statistics (NDs = DL)	3.021	2.913	0.0217	-2.9	0.59	-0.203
Statistics (NDs = DL/2)	1.475	1.427	0.0316	-3.442	0.81	-0.235
Statistics (Gamma ROS Estimates)	19.23	18.5	0.00652	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.533	0.968	-0.274

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.955	0.892	Data Appear Normal
Lilliefors (Detects Only)	0.125	0.215	Data Appear Normal
Lilliefors (NDs = DL)	0.358	0.1	Data Not Normal
Lilliefors (NDs = DL/2)	0.411	0.1	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0525	0.1	Data Appear Normal

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.255	0.741	
Kolmogorov-Smirnov (Detects Only)	0.14	0.21	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	4.69	0.759	
Kolmogorov-Smirnov (NDs = DL)	0.29	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.384	0.771	
Kolmogorov-Smirnov (NDs = DL/2)	0.366	0.103	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.815	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.198	0.101	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.954	0.892	Data Appear Lognormal
Lilliefors (Detects Only)	0.171	0.215	Data Appear Lognormal
Lilliefors (NDs = DL)	0.249	0.1	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.314	0.1	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0685	0.1	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Potassium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Potassium Data	79	0	79	67	12	15.19%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	12	201	271	223.1	217	20.78
Statistics (Detects Only)	67	123	10900	1690	694	2232
Statistics (All: NDs treated as DL value)	79	123	10900	1467	618	2120
Statistics (All: NDs treated as DL/2 value)	79	100.5	10900	1450	618	2131
Statistics (Normal ROS Estimated Data)	79	-1878	10900	1235	618	2322
Statistics (Gamma ROS Estimated Data)	79	0	10900	1433	618	2142
Statistics (Lognormal ROS Estimated Data)	79	104.7	10900	1456	618	2127

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.92	0.893	1837	6.798	1.115	0.164
Statistics (NDs = DL)	0.837	0.814	1752	6.586	1.143	0.174
Statistics (NDs = DL/2)	0.75	0.73	1933	6.481	1.273	0.196
Statistics (Gamma ROS Estimates)	0.163	0.165	8778	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.525	1.216	0.186

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.247	0.108	Data Not Normal
Lilliefors (NDs = DL)	0.263	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.263	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.21	0.0997	Data Not Normal

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.945	0.784	
Kolmogorov-Smirnov (Detects Only)	0.153	0.112	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.288	0.789	
Kolmogorov-Smirnov (NDs = DL)	0.171	0.104	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.192	0.793	
Kolmogorov-Smirnov (NDs = DL/2)	0.147	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	14.88	0.944	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.392	0.113	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.0982	0.108	Data Appear Lognormal
Lilliefors (NDs = DL)	0.106	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.0732	0.0997	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0941	0.0997	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Thallium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Thallium Data	78	0	78	14	64	82.05%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	64	0.13	0.45	0.189	0.15	0.0931
Statistics (Detects Only)	14	1.3	3.2	2.35	2.15	0.656
Statistics (All: NDs treated as DL value)	78	0.13	3.2	0.577	0.16	0.881
Statistics (All: NDs treated as DL/2 value)	78	0.065	3.2	0.499	0.08	0.913
Statistics (Normal ROS Estimated Data)	78	-2.801	3.2	0.136	0.0299	1.376
Statistics (Gamma ROS Estimated Data)	78	1.3	3.2	2.284	2.248	0.286
Statistics (Lognormal ROS Estimated Data)	78	0.239	3.2	1.04	0.821	0.723

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	12.97	12.48	0.181	0.815	0.296	0.364
Statistics (NDs = DL)	0.803	0.78	0.718	-1.289	1.054	-0.817
Statistics (NDs = DL/2)	0.54	0.527	0.925	-1.858	1.309	-0.704
Statistics (Gamma ROS Estimates)	63.67	61.23	0.0359	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.151	0.601	-3.992

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.91	0.874	Data Appear Normal
Lilliefors (Detects Only)	0.162	0.237	Data Appear Normal
Lilliefors (NDs = DL)	0.378	0.1	Data Not Normal
Lilliefors (NDs = DL/2)	0.439	0.1	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0781	0.1	Data Appear Normal

Table C.10-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.489	0.734	
Kolmogorov-Smirnov (Detects Only)	0.167	0.229	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	13.04	0.791	
Kolmogorov-Smirnov (NDs = DL)	0.363	0.105	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	14.9	0.814	
Kolmogorov-Smirnov (NDs = DL/2)	0.374	0.107	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.996	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.217	0.101	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.911	0.874	Data Appear Lognormal
Lilliefors (Detects Only)	0.157	0.237	Data Appear Lognormal
Lilliefors (NDs = DL)	0.336	0.1	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.342	0.1	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.078	0.1	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

ALUMINUM

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	19
Minimum	659
Maximum	28500
Mean of Raw Data	14470
Standard Deviation of Raw Data	6219
Kstar	2.167
Mean of Log Transformed Data	9.37
Standard Deviation of Log Transformed Data	0.89

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.913
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.2
Lilliefors Critical (0.95) Value	0.203

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	2.098
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.322
K-S Critical(0.95) Value	0.2

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.637
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.36
Lilliefors Critical (0.95) Value	0.203

Data not Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	17
Minimum	1.3
Maximum	55
Mean of Raw Data	9.944
Standard Deviation of Raw Data	15.67
Kstar	0.893
Mean of Log Transformed Data	1.732
Standard Deviation of Log Transformed Data	0.908

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.476
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.403
Lilliefors Critical (0.95) Value	0.203

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	2.69
A-D Critical (0.95) Value	0.769
K-S Test Statistic	0.313
K-S Critical(0.95) Value	0.204

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.81
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.222
Lilliefors Critical (0.95) Value	0.203

Data not Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BARIUM

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	19
Minimum	14.6
Maximum	191
Mean of Raw Data	70.2
Standard Deviation of Raw Data	43.4
Kstar	2.605
Mean of Log Transformed Data	4.079
Standard Deviation of Log Transformed Data	0.623

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.87
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.207
Lilliefors Critical (0.95) Value	0.203

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.367
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.13
K-S Critical(0.95) Value	0.2

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.14
Lilliefors Critical (0.95) Value	0.203

Data appear Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BERYLLIUM

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	17
Minimum	0.24
Maximum	1.5
Mean of Raw Data	0.646
Standard Deviation of Raw Data	0.311
Kstar	4.546
Mean of Log Transformed Data	-0.533
Standard Deviation of Log Transformed Data	0.444

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.876
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.219
Lilliefors Critical (0.95) Value	0.203

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.392
A-D Critical (0.95) Value	0.742
K-S Test Statistic	0.16
K-S Critical(0.95) Value	0.199

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.979
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.133
Lilliefors Critical (0.95) Value	0.203

Data appear Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CALCIUM

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	19
Minimum	457
Maximum	26300
Mean of Raw Data	6453
Standard Deviation of Raw Data	6343
Kstar	1.148
Mean of Log Transformed Data	8.348
Standard Deviation of Log Transformed Data	0.996

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.792
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.22
Lilliefors Critical (0.95) Value	0.203

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.279
A-D Critical (0.95) Value	0.761
K-S Test Statistic	0.146
K-S Critical(0.95) Value	0.203

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.106
Lilliefors Critical (0.95) Value	0.203

Data appear Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	19
Minimum	4.1
Maximum	37.6
Mean of Raw Data	22.86
Standard Deviation of Raw Data	7.771
Kstar	4.806
Mean of Log Transformed Data	3.039
Standard Deviation of Log Transformed Data	0.513

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.195
Lilliefors Critical (0.95) Value	0.203

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.448
A-D Critical (0.95) Value	0.742
K-S Test Statistic	0.266
K-S Critical(0.95) Value	0.199

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.729
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.294
Lilliefors Critical (0.95) Value	0.203

Data not Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	14
Minimum	1.8
Maximum	13.2
Mean of Raw Data	6.771
Standard Deviation of Raw Data	2.634
Kstar	5.193
Mean of Log Transformed Data	1.829
Standard Deviation of Log Transformed Data	0.451

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.174
Lilliefors Critical (0.95) Value	0.203

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.658
A-D Critical (0.95) Value	0.742
K-S Test Statistic	0.227
K-S Critical(0.95) Value	0.199

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.894
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.257
Lilliefors Critical (0.95) Value	0.203

Data not Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	17
Minimum	1440
Maximum	32000
Mean of Raw Data	22272
Standard Deviation of Raw Data	7844
Kstar	2.559
Mean of Log Transformed Data	9.835
Standard Deviation of Log Transformed Data	0.821

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.748
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.288
Lilliefors Critical (0.95) Value	0.203

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	3.468
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.386
K-S Critical(0.95) Value	0.2

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.524
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.403
Lilliefors Critical (0.95) Value	0.203

Data not Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	17
Minimum	3.8
Maximum	110
Mean of Raw Data	27.45
Standard Deviation of Raw Data	26.53
Kstar	1.723
Mean of Log Transformed Data	3.043
Standard Deviation of Log Transformed Data	0.705

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.589
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.375
Lilliefors Critical (0.95) Value	0.203

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	2.05
A-D Critical (0.95) Value	0.752
K-S Test Statistic	0.321
K-S Critical(0.95) Value	0.201

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.837
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.27
Lilliefors Critical (0.95) Value	0.203

Data not Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MAGNESIUM

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	19
Minimum	120
Maximum	24400
Mean of Raw Data	5623
Standard Deviation of Raw Data	5942
Kstar	0.901
Mean of Log Transformed Data	8.075
Standard Deviation of Log Transformed Data	1.268

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.776
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.219
Lilliefors Critical (0.95) Value	0.203

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.223
A-D Critical (0.95) Value	0.769
K-S Test Statistic	0.097
K-S Critical(0.95) Value	0.204

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.15
Lilliefors Critical (0.95) Value	0.203

Data appear Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	18
Minimum	10.7
Maximum	894
Mean of Raw Data	333.9
Standard Deviation of Raw Data	206.9
Kstar	1.519
Mean of Log Transformed Data	5.501
Standard Deviation of Log Transformed Data	1.041

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.165
Lilliefors Critical (0.95) Value	0.203

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.847
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.22
K-S Critical(0.95) Value	0.201

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.779
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.283
Lilliefors Critical (0.95) Value	0.203

Data not Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NICKEL

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	16
Minimum	4.3
Maximum	20.9
Mean of Raw Data	9.895
Standard Deviation of Raw Data	5.025
Kstar	4.089
Mean of Log Transformed Data	2.185
Standard Deviation of Log Transformed Data	0.463

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.841
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.239
Lilliefors Critical (0.95) Value	0.203

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.822
A-D Critical (0.95) Value	0.743
K-S Test Statistic	0.201
K-S Critical(0.95) Value	0.199

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.18
Lilliefors Critical (0.95) Value	0.203

Data appear Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

POTASSIUM

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	18
Minimum	89.2
Maximum	5240
Mean of Raw Data	1214
Standard Deviation of Raw Data	1079
Kstar	1.533
Mean of Log Transformed Data	6.795
Standard Deviation of Log Transformed Data	0.89

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.66
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.27
Lilliefors Critical (0.95) Value	0.203

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.916
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.167
K-S Critical(0.95) Value	0.201

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.205
Lilliefors Critical (0.95) Value	0.203

Data not Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SODIUM

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	19
Minimum	86.8
Maximum	370
Mean of Raw Data	177.9
Standard Deviation of Raw Data	83.05
Kstar	4.464
Mean of Log Transformed Data	5.083
Standard Deviation of Log Transformed Data	0.452

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.904
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.189
Lilliefors Critical (0.95) Value	0.203

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.408
A-D Critical (0.95) Value	0.742
K-S Test Statistic	0.158
K-S Critical(0.95) Value	0.199

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.947
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.131
Lilliefors Critical (0.95) Value	0.203

Data appear Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

VANADIUM

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	18
Minimum	5.4
Maximum	56.9
Mean of Raw Data	39.97
Standard Deviation of Raw Data	15.37
Kstar	3.121
Mean of Log Transformed Data	3.546
Standard Deviation of Log Transformed Data	0.666

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.267
Lilliefors Critical (0.95) Value	0.203

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	2.213
A-D Critical (0.95) Value	0.746
K-S Test Statistic	0.342
K-S Critical(0.95) Value	0.199

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.676
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.361
Lilliefors Critical (0.95) Value	0.203

Data not Lognormal at (0.05) Significance Level

Table C.10-3a
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ZINC

Raw Statistics

Number of Valid Samples	19
Number of Unique Samples	19
Minimum	5.5
Maximum	148
Mean of Raw Data	59.84
Standard Deviation of Raw Data	40.55
Kstar	1.817
Mean of Log Transformed Data	3.837
Standard Deviation of Log Transformed Data	0.803

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.205
Lilliefors Critical (0.95) Value	0.203

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.26
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.122
K-S Critical(0.95) Value	0.201

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical (0.95) Value	0.901
Lilliefors Test Statistic	0.124
Lilliefors Critical (0.95) Value	0.203

Data appear Lognormal at (0.05) Significance Level

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

ANTIMONY

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
ANTIMONY Data	18	0	18	15	3	16.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.17	0.47	0.357	0.43	0.163
Statistics (Detects Only)	15	0.46	1.3	0.658	0.54	0.257
Statistics (All: NDs treated as DL value)	18	0.17	1.3	0.608	0.525	0.266
Statistics (All: NDs treated as DL/2 value)	18	0.085	1.3	0.578	0.525	0.298
Statistics (Normal ROS Estimated Data)	18	0.117	1.3	0.572	0.525	0.307
Statistics (Gamma ROS Estimated Data)	18	0.347	1.3	0.61	0.525	0.259
Statistics (Lognormal ROS Estimated Data)	18	0.305	1.3	0.601	0.525	0.268

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	9.158	7.669	0.0719	-0.474	0.324	-0.684
Statistics (NDs = DL)	6.083	5.106	0.0999	-0.582	0.431	-0.74
Statistics (NDs = DL/2)	3.495	2.95	0.165	-0.698	0.624	-0.894
Statistics (Gamma ROS Estimates)	7.613	6.382	0.0801	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.588	0.394	-0.67

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.72	0.881	Data Not Normal
Lilliefors (Detects Only)	0.301	0.229	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.809	0.897	Data Not Normal
Lilliefors (NDs = DL)	0.279	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.887	0.897	Data Not Normal
Lilliefors (NDs = DL/2)	0.233	0.209	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.881	0.897	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.225	0.209	Data Not Normal

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.557	0.738	
Kolmogorov-Smirnov (Detects Only)	0.289	0.222	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.238	0.742	
Kolmogorov-Smirnov (NDs = DL)	0.23	0.204	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.889	0.744	
Kolmogorov-Smirnov (NDs = DL/2)	0.243	0.205	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.111	0.741	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.247	0.204	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.788	0.881	Data Not Lognormal
Lilliefors (Detects Only)	0.274	0.229	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.854	0.897	Data Not Lognormal
Lilliefors (NDs = DL)	0.216	0.209	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.859	0.897	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.283	0.209	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.915	0.897	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.196	0.209	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CADMIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
CADMIUM Data	19	0	19	8	11	57.89%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	0.03	0.05	0.0418	0.04	0.00751
Statistics (Detects Only)	8	0.09	0.75	0.261	0.19	0.222
Statistics (All: NDs treated as DL value)	19	0.03	0.75	0.134	0.05	0.178
Statistics (All: NDs treated as DL/2 value)	19	0.015	0.75	0.122	0.025	0.184
Statistics (Normal ROS Estimated Data)	19	-0.727	0.75	-0.128	-0.179	0.395
Statistics (Gamma ROS Estimated Data)	19	0.09	0.75	0.259	0.245	0.14
Statistics (Lognormal ROS Estimated Data)	19	0.00591	0.75	0.123	0.0417	0.184

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	2.052	1.763	0.127	-1.605	0.752	-0.468
Statistics (NDs = DL)	1.109	0.969	0.121	-2.523	0.941	-0.373
Statistics (NDs = DL/2)	0.731	0.651	0.167	-2.924	1.255	-0.429
Statistics (Gamma ROS Estimates)	4.566	3.88	0.0567	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.992	1.4	-0.468

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.792	0.818	Data Not Normal
Lilliefors (Detects Only)	0.22	0.313	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.622	0.901	Data Not Normal
Lilliefors (NDs = DL)	0.283	0.203	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.638	0.901	Data Not Normal
Lilliefors (NDs = DL/2)	0.281	0.203	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.965	0.901	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.13	0.203	Data Appear Normal

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.388	0.724	
Kolmogorov-Smirnov (Detects Only)	0.214	0.297	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.611	0.767	
Kolmogorov-Smirnov (NDs = DL)	0.29	0.204	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.605	0.781	
Kolmogorov-Smirnov (NDs = DL/2)	0.323	0.206	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.079	0.744	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.222	0.199	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.924	0.818	Data Appear Lognormal
Lilliefors (Detects Only)	0.184	0.313	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.855	0.901	Data Not Lognormal
Lilliefors (NDs = DL)	0.271	0.203	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.84	0.901	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.308	0.203	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.967	0.901	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.114	0.203	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COPPER

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
COPPER Data	19	0	19	18	1	5.26%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	18	2.1	76	19.99	11.8	20.16
Statistics (All: NDs treated as DL value)	19	0.16	76	18.95	11.6	20.11
Statistics (All: NDs treated as DL/2 value)	19	0.08	76	18.95	11.6	20.12
Statistics (Normal ROS Estimated Data)	19	-25.63	76	17.59	11.6	22.21
Statistics (Gamma ROS Estimated Data)	19	0	76	18.94	11.6	20.12
Statistics (Lognormal ROS Estimated Data)	19	1.009	76	19	11.6	20.07

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.223	1.065	16.35	2.534	1.025	0.405
Statistics (NDs = DL)	0.915	0.805	20.72	2.304	1.413	0.613
Statistics (NDs = DL/2)	0.871	0.768	21.76	2.268	1.53	0.675
Statistics (Gamma ROS Estimates)	0.403	0.374	47.02	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.401	1.152	0.48

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.797	0.897	Data Not Normal
Lilliefors (Detects Only)	0.285	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.8	0.901	Data Not Normal
Lilliefors (NDs = DL)	0.283	0.203	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.801	0.901	Data Not Normal
Lilliefors (NDs = DL/2)	0.283	0.203	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.887	0.901	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.25	0.203	Data Not Normal

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.441	0.762	
Kolmogorov-Smirnov (Detects Only)	0.193	0.208	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.297	0.772	
Kolmogorov-Smirnov (NDs = DL)	0.153	0.205	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.315	0.774	
Kolmogorov-Smirnov (NDs = DL/2)	0.147	0.205	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.941	0.822	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.266	0.212	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.964	0.897	Data Appear Lognormal
Lilliefors (Detects Only)	0.131	0.209	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.905	0.901	Data Appear Lognormal
Lilliefors (NDs = DL)	0.171	0.203	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.865	0.901	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.177	0.203	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.971	0.901	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.146	0.203	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MERCURY

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
MERCURY Data	19	0	19	18	1	5.26%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	18	0.042	2.1	0.254	0.09	0.492
Statistics (All: NDs treated as DL value)	19	0.023	2.1	0.242	0.084	0.481
Statistics (All: NDs treated as DL/2 value)	19	0.0115	2.1	0.242	0.084	0.482
Statistics (Normal ROS Estimated Data)	19	-0.561	2.1	0.212	0.084	0.514
Statistics (Gamma ROS Estimated Data)	19	0	2.1	0.241	0.084	0.482
Statistics (Lognormal ROS Estimated Data)	19	0.0121	2.1	0.242	0.084	0.482

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.801	0.71	0.318	-2.109	1.014	-0.481
Statistics (NDs = DL)	0.766	0.68	0.316	-2.197	1.057	-0.481
Statistics (NDs = DL/2)	0.738	0.656	0.328	-2.233	1.124	-0.503
Statistics (Gamma ROS Estimates)	0.396	0.368	0.609	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.231	1.119	-0.501

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.454	0.897	Data Not Normal
Lilliefors (Detects Only)	0.372	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.449	0.901	Data Not Normal
Lilliefors (NDs = DL)	0.368	0.203	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.452	0.901	Data Not Normal
Lilliefors (NDs = DL/2)	0.367	0.203	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.573	0.901	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.346	0.203	Data Not Normal

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.345	0.776	
Kolmogorov-Smirnov (Detects Only)	0.304	0.211	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.225	0.778	
Kolmogorov-Smirnov (NDs = DL)	0.297	0.206	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.06	0.78	
Kolmogorov-Smirnov (NDs = DL/2)	0.289	0.206	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.214	0.824	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.331	0.213	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.816	0.897	Data Not Lognormal
Lilliefors (Detects Only)	0.25	0.209	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.869	0.901	Data Not Lognormal
Lilliefors (NDs = DL)	0.232	0.203	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.896	0.901	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.216	0.203	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.895	0.901	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.217	0.203	Data Not Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SELENIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SELENIUM Data	19	0	19	18	1	5.26%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	18	0.475	3.3	1.381	1.25	0.713
Statistics (All: NDs treated as DL value)	19	0.42	3.3	1.33	1.2	0.727
Statistics (All: NDs treated as DL/2 value)	19	0.21	3.3	1.319	1.2	0.743
Statistics (Normal ROS Estimated Data)	19	-0.232	3.3	1.296	1.2	0.785
Statistics (Gamma ROS Estimated Data)	19	0.0265	3.3	1.31	1.2	0.759
Statistics (Lognormal ROS Estimated Data)	19	0.393	3.3	1.329	1.2	0.729

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	4.715	4.006	0.293	0.213	0.48	2.255
Statistics (NDs = DL)	4.025	3.425	0.33	0.156	0.528	3.386
Statistics (NDs = DL/2)	3.333	2.842	0.396	0.12	0.619	5.178
Statistics (Gamma ROS Estimates)	2.081	1.788	0.629	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.153	0.536	3.51

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.824	0.897	Data Not Normal
Lilliefors (Detects Only)	0.213	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.84	0.901	Data Not Normal
Lilliefors (NDs = DL)	0.201	0.203	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.862	0.901	Data Not Normal
Lilliefors (NDs = DL/2)	0.195	0.203	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.888	0.901	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.191	0.203	Data Appear Normal

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.646	0.743	
Kolmogorov-Smirnov (Detects Only)	0.157	0.204	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.585	0.745	
Kolmogorov-Smirnov (NDs = DL)	0.136	0.199	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.619	0.747	
Kolmogorov-Smirnov (NDs = DL/2)	0.138	0.2	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.127	0.752	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.208	0.201	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.938	0.897	Data Appear Lognormal
Lilliefors (Detects Only)	0.141	0.209	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.939	0.901	Data Appear Lognormal
Lilliefors (NDs = DL)	0.151	0.203	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.91	0.901	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.172	0.203	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.94	0.901	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.154	0.203	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SILVER

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SILVER Data	19	0	19	4	15	78.95%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	15	0.08	0.13	0.092	0.09	0.0142
Statistics (Detects Only)	4	0.071	0.2	0.138	0.14	0.0552
Statistics (All: NDs treated as DL value)	19	0.071	0.2	0.102	0.09	0.0321
Statistics (All: NDs treated as DL/2 value)	19	0.04	0.2	0.0653	0.045	0.045
Statistics (Normal ROS Estimated Data)	19	0.00492	0.2	0.0776	0.071	0.0477
Statistics (Gamma ROS Estimated Data)	19	0.071	0.2	0.136	0.135	0.0228
Statistics (Lognormal ROS Estimated Data)	19	0.0422	0.2	0.0842	0.0711	0.0395

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	7.354	6.228	0.0187	-2.052	0.447	-0.218
Statistics (NDs = DL)	13.6	11.49	0.00747	-2.324	0.265	-0.114
Statistics (NDs = DL/2)	3.672	3.127	0.0178	-2.871	0.488	-0.17
Statistics (Gamma ROS Estimates)	33.58	28.31	0.00404	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.556	0.398	-0.155

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.995	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.157	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.76	0.901	Data Not Normal
Lilliefors (NDs = DL)	0.257	0.203	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.614	0.901	Data Not Normal
Lilliefors (NDs = DL/2)	0.328	0.203	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.942	0.901	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.148	0.203	Data Appear Normal

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.229	0.658	
Kolmogorov-Smirnov (Detects Only)	0.205	0.395	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.255	0.741	
Kolmogorov-Smirnov (NDs = DL)	0.224	0.198	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.539	0.746	
Kolmogorov-Smirnov (NDs = DL/2)	0.307	0.199	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.397	0.74	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.313	0.198	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.962	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.189	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.851	0.901	Data Not Lognormal
Lilliefors (NDs = DL)	0.205	0.203	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.723	0.901	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.285	0.203	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.948	0.901	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.148	0.203	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3b
Goodness of Fit - SWMU 40 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

THALLIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
THALLIUM Data	14	0	14	2	12	85.71%

Insufficient detected observations for valid results

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

ALUMINUM

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	49
Minimum	659
Maximum	47500
Mean of Raw Data	18223
Standard Deviation of Raw Data	9516
Kstar	2.87
Mean of Log Transformed Data	9.637
Standard Deviation of Log Transformed Data	0.711

Normal Distribution Test Results

Lilliefors Test Statistic	0.13
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.047
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.153
K-S Critical(0.95) Value	0.125

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.203
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BARIUM

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	50
Minimum	14.6
Maximum	250
Mean of Raw Data	74.67
Standard Deviation of Raw Data	40.53
Kstar	4.044
Mean of Log Transformed Data	4.192
Standard Deviation of Log Transformed Data	0.502

Normal Distribution Test Results

Lilliefors Test Statistic	0.162
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.763
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.105
K-S Critical(0.95) Value	0.125

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.116
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BERYLLIUM

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	41
Minimum	0.24
Maximum	3
Mean of Raw Data	0.928
Standard Deviation of Raw Data	0.653
Kstar	2.539
Mean of Log Transformed Data	-0.272
Standard Deviation of Log Transformed Data	0.617

Normal Distribution Test Results

Lilliefors Test Statistic	0.232
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.333
A-D Critical (0.95) Value	0.759
K-S Test Statistic	0.163
K-S Critical(0.95) Value	0.125

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.119
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CALCIUM

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	51
Minimum	457
Maximum	102000
Mean of Raw Data	11573
Standard Deviation of Raw Data	17796
Kstar	0.717
Mean of Log Transformed Data	8.555
Standard Deviation of Log Transformed Data	1.286

Normal Distribution Test Results

Lilliefors Test Statistic	0.266
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.336
A-D Critical (0.95) Value	0.793
K-S Test Statistic	0.157
K-S Critical(0.95) Value	0.129

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.0879
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	45
Minimum	4.1
Maximum	234
Mean of Raw Data	33.84
Standard Deviation of Raw Data	31.88
Kstar	2.633
Mean of Log Transformed Data	3.331
Standard Deviation of Log Transformed Data	0.575

Normal Distribution Test Results

Lilliefors Test Statistic	0.311
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	2.733
A-D Critical (0.95) Value	0.758
K-S Test Statistic	0.209
K-S Critical(0.95) Value	0.125

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.16
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	38
Minimum	1.8
Maximum	24.85
Mean of Raw Data	7.72
Standard Deviation of Raw Data	3.5
Kstar	5.702
Mean of Log Transformed Data	1.959
Standard Deviation of Log Transformed Data	0.42

Normal Distribution Test Results

Lilliefors Test Statistic	0.151
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.657
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.0951
K-S Critical(0.95) Value	0.124

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.115
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	44
Minimum	1440
Maximum	98100
Mean of Raw Data	28215
Standard Deviation of Raw Data	14580
Kstar	3.433
Mean of Log Transformed Data	10.1
Standard Deviation of Log Transformed Data	0.642

Normal Distribution Test Results

Lilliefors Test Statistic	0.169
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	2.462
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.171
K-S Critical(0.95) Value	0.125

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.216
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	48
Minimum	2.4
Maximum	1100
Mean of Raw Data	54.82
Standard Deviation of Raw Data	155.5
Kstar	0.665
Mean of Log Transformed Data	3.13
Standard Deviation of Log Transformed Data	1.075

Normal Distribution Test Results

Lilliefors Test Statistic	0.368
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	4.364
A-D Critical (0.95) Value	0.798
K-S Test Statistic	0.242
K-S Critical(0.95) Value	0.13

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.154
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MAGNESIUM

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	51
Minimum	120
Maximum	66200
Mean of Raw Data	11621
Standard Deviation of Raw Data	13063
Kstar	0.931
Mean of Log Transformed Data	8.767
Standard Deviation of Log Transformed Data	1.235

Normal Distribution Test Results

Lilliefors Test Statistic	0.192
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.254
A-D Critical (0.95) Value	0.781
K-S Test Statistic	0.0664
K-S Critical(0.95) Value	0.128

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.0722
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	49
Minimum	10.7
Maximum	952
Mean of Raw Data	364.6
Standard Deviation of Raw Data	183.2
Kstar	2.879
Mean of Log Transformed Data	5.726
Standard Deviation of Log Transformed Data	0.732

Normal Distribution Test Results

Lilliefors Test Statistic	0.0954
Lilliefors Critical (0.95) Value	0.124

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.073
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.148
K-S Critical(0.95) Value	0.125

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.199
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NICKEL

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	45
Minimum	3.6
Maximum	77.7
Mean of Raw Data	17.84
Standard Deviation of Raw Data	12.89
Kstar	2.339
Mean of Log Transformed Data	2.666
Standard Deviation of Log Transformed Data	0.665

Normal Distribution Test Results

Lilliefors Test Statistic	0.135
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.386
A-D Critical (0.95) Value	0.76
K-S Test Statistic	0.072
K-S Critical(0.95) Value	0.125

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.0762
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

POTASSIUM

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	47
Minimum	89.2
Maximum	7810
Mean of Raw Data	1930
Standard Deviation of Raw Data	1563
Kstar	1.707
Mean of Log Transformed Data	7.263
Standard Deviation of Log Transformed Data	0.847

Normal Distribution Test Results

Lilliefors Test Statistic	0.205
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.688
A-D Critical (0.95) Value	0.765
K-S Test Statistic	0.109
K-S Critical(0.95) Value	0.126

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.107
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

VANADIUM

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	49
Minimum	5.4
Maximum	95.2
Mean of Raw Data	44
Standard Deviation of Raw Data	18.37
Kstar	3.989
Mean of Log Transformed Data	3.661
Standard Deviation of Log Transformed Data	0.575

Normal Distribution Test Results

Lilliefors Test Statistic	0.0784
Lilliefors Critical (0.95) Value	0.124

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.563
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.128
K-S Critical(0.95) Value	0.125

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.168
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

Table C.10-3c
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ZINC

Raw Statistics

Number of Valid Samples	51
Number of Unique Samples	51
Minimum	5.5
Maximum	16000
Mean of Raw Data	389.8
Standard Deviation of Raw Data	2232
Kstar	0.352
Mean of Log Transformed Data	4.109
Standard Deviation of Log Transformed Data	1.101

Normal Distribution Test Results

Lilliefors Test Statistic	0.485
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	11.9
A-D Critical (0.95) Value	0.848
K-S Test Statistic	0.381
K-S Critical(0.95) Value	0.134

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.17
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

ANTIMONY

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
ANTIMONY Data	47	0	47	35	12	25.53%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	12	0.17	0.59	0.449	0.46	0.099
Statistics (Detects Only)	35	0.31	6.1	1.006	0.57	1.17
Statistics (All: NDs treated as DL value)	47	0.17	6.1	0.864	0.54	1.036
Statistics (All: NDs treated as DL/2 value)	47	0.085	6.1	0.807	0.53	1.063
Statistics (Normal ROS Estimated Data)	47	-1.434	6.1	0.605	0.53	1.237
Statistics (Gamma ROS Estimated Data)	47	0	6.1	0.84	0.54	1.056
Statistics (Lognormal ROS Estimated Data)	47	0.133	6.1	0.815	0.53	1.059

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.833	1.73	0.549	-0.291	0.656	-2.259
Statistics (NDs = DL)	1.914	1.806	0.452	-0.43	0.632	-1.47
Statistics (NDs = DL/2)	1.42	1.343	0.568	-0.607	0.799	-1.318
Statistics (Gamma ROS Estimates)	0.547	0.526	1.535	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.575	0.761	-1.325

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.524	0.934	Data Not Normal
Lilliefors (Detects Only)	0.298	0.15	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.481	0.946	Data Not Normal
Lilliefors (NDs = DL)	0.327	0.129	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.533	0.946	Data Not Normal
Lilliefors (NDs = DL/2)	0.305	0.129	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.756	0.946	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.237	0.129	Data Not Normal

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
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Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.604	0.762	
Kolmogorov-Smirnov (Detects Only)	0.258	0.151	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	5.268	0.763	
Kolmogorov-Smirnov (NDs = DL)	0.259	0.131	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.563	0.769	
Kolmogorov-Smirnov (NDs = DL/2)	0.203	0.132	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.445	0.81	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.311	0.136	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.817	0.934	Data Not Lognormal
Lilliefors (Detects Only)	0.204	0.15	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.817	0.946	Data Not Lognormal
Lilliefors (NDs = DL)	0.221	0.129	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.939	0.946	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.137	0.129	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.932	0.946	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.153	0.129	Data Not Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
ARSENIC Data	51	0	51	50	1	1.96%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	50	1.3	74.6	10.72	5	16.55
Statistics (All: NDs treated as DL value)	51	0.27	74.6	10.51	5	16.45
Statistics (All: NDs treated as DL/2 value)	51	0.135	74.6	10.51	5	16.45
Statistics (Normal ROS Estimated Data)	51	-20.72	74.6	10.1	5	16.96
Statistics (Gamma ROS Estimated Data)	51	0	74.6	10.51	5	16.45
Statistics (Lognormal ROS Estimated Data)	51	0.634	74.6	10.52	5	16.44

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.006	0.96	10.65	1.799	0.918	0.51
Statistics (NDs = DL)	0.945	0.903	11.12	1.738	1.008	0.58
Statistics (NDs = DL/2)	0.927	0.886	11.33	1.724	1.053	0.611
Statistics (Gamma ROS Estimates)	0.618	0.595	17	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.755	0.962	0.548

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.525	0.947	Data Not Normal
Lilliefors (Detects Only)	0.336	0.125	Data Not Normal
Lilliefors (NDs = DL)	0.337	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.337	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.325	0.124	Data Not Normal

Table C.10-3d
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Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	5.025	0.78	
Kolmogorov-Smirnov (Detects Only)	0.256	0.129	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.562	0.783	
Kolmogorov-Smirnov (NDs = DL)	0.246	0.128	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.487	0.784	
Kolmogorov-Smirnov (NDs = DL/2)	0.243	0.128	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.696	0.804	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.256	0.13	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.861	0.947	Data Not Lognormal
Lilliefors (Detects Only)	0.175	0.125	Data Not Lognormal
Lilliefors (NDs = DL)	0.161	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.159	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.165	0.124	Data Not Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
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CADMIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
CADMIUM Data	51	0	51	31	20	39.22%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	20	0.03	0.05	0.0425	0.04	0.00786
Statistics (Detects Only)	31	0.08	7.6	0.76	0.32	1.4
Statistics (All: NDs treated as DL value)	51	0.03	7.6	0.479	0.14	1.141
Statistics (All: NDs treated as DL/2 value)	51	0.015	7.6	0.47	0.14	1.144
Statistics (Normal ROS Estimated Data)	51	-3.263	7.6	-0.263	0.14	1.738
Statistics (Gamma ROS Estimated Data)	51	0	7.6	0.577	0.3	1.128
Statistics (Lognormal ROS Estimated Data)	51	0.00646	7.6	0.475	0.14	1.142

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.851	0.814	0.892	-0.966	1.056	-1.093
Statistics (NDs = DL)	0.568	0.548	0.842	-1.833	1.368	-0.746
Statistics (NDs = DL/2)	0.474	0.46	0.991	-2.105	1.653	-0.785
Statistics (Gamma ROS Estimates)	0.222	0.222	2.603	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.003	1.601	-0.799

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.471	0.929	Data Not Normal
Lilliefors (Detects Only)	0.314	0.159	Data Not Normal
Lilliefors (NDs = DL)	0.347	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.345	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.186	0.124	Data Not Normal

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
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Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.85	0.783	
Kolmogorov-Smirnov (Detects Only)	0.254	0.163	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.02	0.809	
Kolmogorov-Smirnov (NDs = DL)	0.192	0.131	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.432	0.821	
Kolmogorov-Smirnov (NDs = DL/2)	0.197	0.132	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.717	0.898	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.327	0.137	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.942	0.929	Data Appear Lognormal
Lilliefors (Detects Only)	0.178	0.159	Data Not Lognormal
Lilliefors (NDs = DL)	0.195	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.223	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0914	0.124	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
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COPPER

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
COPPER Data	50	0	50	49	1	2.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	49	2.1	52000	1098	20.9	7424
Statistics (All: NDs treated as DL value)	50	0.16	52000	1076	20.65	7349
Statistics (All: NDs treated as DL/2 value)	50	0.08	52000	1076	20.65	7349
Statistics (Normal ROS Estimated Data)	50	-5357	52000	968.4	20.65	7404
Statistics (Gamma ROS Estimated Data)	50	0	52000	1076	20.65	7349
Statistics (Lognormal ROS Estimated Data)	50	0.758	52000	1076	20.65	7349

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.193	0.194	5698	3.158	1.518	0.481
Statistics (NDs = DL)	0.189	0.191	5684	3.058	1.66	0.543
Statistics (NDs = DL/2)	0.189	0.191	5701	3.044	1.704	0.56
Statistics (Gamma ROS Estimates)	0.175	0.178	6156	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.089	1.579	0.511

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.149	0.947	Data Not Normal
Lilliefors (Detects Only)	0.512	0.127	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.147	0.947	Data Not Normal
Lilliefors (NDs = DL)	0.512	0.125	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.147	0.947	Data Not Normal
Lilliefors (NDs = DL/2)	0.512	0.125	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.176	0.947	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.506	0.125	Data Not Normal

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
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Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	13.61	0.912	
Kolmogorov-Smirnov (Detects Only)	0.454	0.141	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	13.33	0.915	
Kolmogorov-Smirnov (NDs = DL)	0.449	0.139	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	13.26	0.915	
Kolmogorov-Smirnov (NDs = DL/2)	0.448	0.139	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	12.22	0.924	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.428	0.14	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.79	0.947	Data Not Lognormal
Lilliefors (Detects Only)	0.163	0.127	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.837	0.947	Data Not Lognormal
Lilliefors (NDs = DL)	0.157	0.125	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.833	0.947	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.16	0.125	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.826	0.947	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.155	0.125	Data Not Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
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MERCURY

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
MERCURY Data	51	0	51	45	6	11.76%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	6	0.019	0.025	0.0225	0.0225	0.00207
Statistics (Detects Only)	45	0.026	11	0.673	0.12	1.742
Statistics (All: NDs treated as DL value)	51	0.019	11	0.597	0.096	1.647
Statistics (All: NDs treated as DL/2 value)	51	0.0095	11	0.596	0.096	1.648
Statistics (Normal ROS Estimated Data)	51	-2.089	11	0.379	0.096	1.826
Statistics (Gamma ROS Estimated Data)	51	0	11	0.594	0.096	1.648
Statistics (Lognormal ROS Estimated Data)	51	0.00574	11	0.595	0.096	1.648

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.493	0.478	1.365	-1.685	1.421	-0.844
Statistics (NDs = DL)	0.455	0.441	1.312	-1.934	1.501	-0.776
Statistics (NDs = DL/2)	0.434	0.421	1.373	-2.015	1.616	-0.802
Statistics (Gamma ROS Estimates)	0.214	0.214	2.778	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.055	1.682	-0.818

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.4	0.945	Data Not Normal
Lilliefors (Detects Only)	0.355	0.132	Data Not Normal
Lilliefors (NDs = DL)	0.363	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.361	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.306	0.124	Data Not Normal

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
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Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.908	0.815	
Kolmogorov-Smirnov (Detects Only)	0.25	0.139	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.277	0.825	
Kolmogorov-Smirnov (NDs = DL)	0.24	0.132	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.613	0.83	
Kolmogorov-Smirnov (NDs = DL/2)	0.231	0.132	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.037	0.901	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.284	0.137	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.905	0.945	Data Not Lognormal
Lilliefors (Detects Only)	0.162	0.132	Data Not Lognormal
Lilliefors (NDs = DL)	0.151	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.124	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.112	0.124	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
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SELENIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SELENIUM Data	51	0	51	48	3	5.88%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.36	0.46	0.413	0.42	0.0503
Statistics (Detects Only)	48	0.12	7.45	1.75	1.3	1.497
Statistics (All: NDs treated as DL value)	51	0.12	7.45	1.671	1.3	1.485
Statistics (All: NDs treated as DL/2 value)	51	0.12	7.45	1.659	1.3	1.497
Statistics (Normal ROS Estimated Data)	51	-1.081	7.45	1.587	1.3	1.593
Statistics (Gamma ROS Estimated Data)	51	0	7.45	1.647	1.3	1.509
Statistics (Lognormal ROS Estimated Data)	51	0.12	7.45	1.663	1.3	1.492

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	2.009	1.904	0.871	0.29	0.745	2.566
Statistics (NDs = DL)	1.859	1.763	0.899	0.221	0.775	3.508
Statistics (NDs = DL/2)	1.682	1.596	0.986	0.18	0.849	4.709
Statistics (Gamma ROS Estimates)	0.447	0.434	3.68	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.199	0.811	4.079

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.741	0.947	Data Not Normal
Lilliefors (Detects Only)	0.252	0.128	Data Not Normal
Lilliefors (NDs = DL)	0.243	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.24	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.226	0.124	Data Not Normal

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
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Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.994	0.762	
Kolmogorov-Smirnov (Detects Only)	0.153	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.857	0.764	
Kolmogorov-Smirnov (NDs = DL)	0.14	0.126	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.698	0.766	
Kolmogorov-Smirnov (NDs = DL/2)	0.135	0.126	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	7.976	0.827	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.346	0.132	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.971	0.947	Data Appear Lognormal
Lilliefors (Detects Only)	0.11	0.128	Data Appear Lognormal
Lilliefors (NDs = DL)	0.0975	0.124	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.111	0.124	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0965	0.124	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
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SILVER

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SILVER Data	51	0	51	18	33	64.71%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	33	0.08	0.13	0.0924	0.09	0.0117
Statistics (Detects Only)	18	0.071	2.71	0.539	0.195	0.812
Statistics (All: NDs treated as DL value)	51	0.071	2.71	0.25	0.1	0.52
Statistics (All: NDs treated as DL/2 value)	51	0.04	2.71	0.22	0.05	0.53
Statistics (Normal ROS Estimated Data)	51	-2.152	2.71	-0.458	-0.496	0.989
Statistics (Gamma ROS Estimated Data)	51	0.071	2.71	0.552	0.528	0.477
Statistics (Lognormal ROS Estimated Data)	51	0.00322	2.71	0.21	0.0497	0.534

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.873	0.835	0.617	-1.29	1.078	-0.835
Statistics (NDs = DL)	0.945	0.903	0.265	-2.001	0.828	-0.414
Statistics (NDs = DL/2)	0.652	0.627	0.337	-2.45	1.073	-0.438
Statistics (Gamma ROS Estimates)	2.212	2.095	0.25	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.939	1.568	-0.533

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.569	0.897	Data Not Normal
Lilliefors (Detects Only)	0.303	0.209	Data Not Normal
Lilliefors (NDs = DL)	0.381	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.367	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.103	0.124	Data Appear Normal

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
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Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.449	0.772	
Kolmogorov-Smirnov (Detects Only)	0.225	0.21	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	9.426	0.783	
Kolmogorov-Smirnov (NDs = DL)	0.353	0.128	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.856	0.802	
Kolmogorov-Smirnov (NDs = DL/2)	0.308	0.13	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.745	0.762	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.24	0.126	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.89	0.897	Data Not Lognormal
Lilliefors (Detects Only)	0.172	0.209	Data Appear Lognormal
Lilliefors (NDs = DL)	0.304	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.29	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0655	0.124	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SODIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SODIUM Data	51	0	51	50	1	1.96%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	50	86.8	4690	642.3	236.5	1008
Statistics (All: NDs treated as DL value)	51	38.3	4690	630.4	234	1001
Statistics (All: NDs treated as DL/2 value)	51	19.15	4690	630.1	234	1001
Statistics (Normal ROS Estimated Data)	51	-1346	4690	603.3	234	1036
Statistics (Gamma ROS Estimated Data)	51	0	4690	629.7	234	1001
Statistics (Lognormal ROS Estimated Data)	51	23.8	4690	630.1	234	1001

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.874	0.835	735.3	5.793	1.042	0.18
Statistics (NDs = DL)	0.847	0.811	744.1	5.751	1.074	0.187
Statistics (NDs = DL/2)	0.833	0.798	755.9	5.738	1.105	0.193
Statistics (Gamma ROS Estimates)	0.536	0.518	1174	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	5.742	1.095	0.191

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.565	0.947	Data Not Normal
Lilliefors (Detects Only)	0.325	0.125	Data Not Normal
Lilliefors (NDs = DL)	0.327	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.326	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.313	0.124	Data Not Normal

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.796	0.787	
Kolmogorov-Smirnov (Detects Only)	0.256	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.608	0.788	
Kolmogorov-Smirnov (NDs = DL)	0.251	0.129	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.48	0.789	
Kolmogorov-Smirnov (NDs = DL/2)	0.248	0.129	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.621	0.811	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.252	0.131	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.888	0.947	Data Not Lognormal
Lilliefors (Detects Only)	0.17	0.125	Data Not Lognormal
Lilliefors (NDs = DL)	0.161	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.158	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.159	0.124	Data Not Lognormal

Note: DL/2 is not a recommended method.

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

THALLIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
THALLIUM Data	32	0	32	7	25	78.13%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	25	0.26	0.81	0.488	0.59	0.195
Statistics (Detects Only)	7	0.26	1.3	0.556	0.41	0.38
Statistics (All: NDs treated as DL value)	32	0.26	1.3	0.503	0.45	0.241
Statistics (All: NDs treated as DL/2 value)	32	0.13	1.3	0.312	0.295	0.229
Statistics (Normal ROS Estimated Data)	32	-0.386	1.3	0.098	0.0414	0.339
Statistics (Gamma ROS Estimated Data)	32	0.26	1.3	0.573	0.583	0.185
Statistics (Lognormal ROS Estimated Data)	32	0.0948	1.3	0.264	0.196	0.235

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	3.164	2.889	0.176	-0.754	0.596	-0.79
Statistics (NDs = DL)	5.016	4.567	0.1	-0.791	0.456	-0.577
Statistics (NDs = DL/2)	3.135	2.862	0.0996	-1.332	0.552	-0.414
Statistics (Gamma ROS Estimates)	11.04	10.03	0.0518	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.532	0.566	-0.37

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.808	0.803	Data Appear Normal
Lilliefors (Detects Only)	0.283	0.335	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.848	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.188	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.67	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.253	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.878	0.93	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.165	0.157	Data Not Normal

Table C.10-3d
Goodness of Fit - SWMU 40 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.443	0.712	
Kolmogorov-Smirnov (Detects Only)	0.226	0.314	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.471	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.194	0.156	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.38	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.163	0.156	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.895	0.746	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.138	0.155	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.909	0.803	Data Appear Lognormal
Lilliefors (Detects Only)	0.187	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.882	0.93	Data Not Lognormal
Lilliefors (NDs = DL)	0.193	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.891	0.93	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.16	0.157	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.895	0.93	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.165	0.157	Data Not Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

ALUMINUM

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	3460
Maximum	33000
Mean of Raw Data	10456
Standard Deviation of Raw Data	10571
Kstar	1.067
Mean of Log Transformed Data	8.933
Standard Deviation of Log Transformed Data	0.805

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.717
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.313
Lilliefors Critical (0.95) Value	0.335

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.548
A-D Critical (0.95) Value	0.719
K-S Test Statistic	0.254
K-S Critical(0.95) Value	0.316

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.2
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ANTIMONY

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	0.2
Maximum	16.4
Mean of Raw Data	2.834
Standard Deviation of Raw Data	5.998
Kstar	0.371
Mean of Log Transformed Data	-0.284
Standard Deviation of Log Transformed Data	1.513

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.512
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.445
Lilliefors Critical (0.95) Value	0.335

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.066
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.345
K-S Critical(0.95) Value	0.328

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.829
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.265
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	4.7
Maximum	16.1
Mean of Raw Data	10.41
Standard Deviation of Raw Data	5.215
Kstar	2.519
Mean of Log Transformed Data	2.221
Standard Deviation of Log Transformed Data	0.55

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.831
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.239
Lilliefors Critical (0.95) Value	0.335

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.563
A-D Critical (0.95) Value	0.71
K-S Test Statistic	0.259
K-S Critical(0.95) Value	0.313

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.241
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BARIUM

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	51.3
Maximum	180
Mean of Raw Data	94.91
Standard Deviation of Raw Data	44.22
Kstar	3.644
Mean of Log Transformed Data	4.47
Standard Deviation of Log Transformed Data	0.429

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.889
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.203
Lilliefors Critical (0.95) Value	0.335

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.248
A-D Critical (0.95) Value	0.71
K-S Test Statistic	0.181
K-S Critical(0.95) Value	0.313

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.153
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BERYLLIUM

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	0.29
Maximum	1.6
Mean of Raw Data	0.74
Standard Deviation of Raw Data	0.489
Kstar	1.666
Mean of Log Transformed Data	-0.494
Standard Deviation of Log Transformed Data	0.677

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.886
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.228
Lilliefors Critical (0.95) Value	0.335

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.392
A-D Critical (0.95) Value	0.713
K-S Test Statistic	0.262
K-S Critical(0.95) Value	0.314

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.246
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CALCIUM

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	2610
Maximum	172000
Mean of Raw Data	77373
Standard Deviation of Raw Data	82490
Kstar	0.485
Mean of Log Transformed Data	10.37
Standard Deviation of Log Transformed Data	1.657

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.728
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.336
Lilliefors Critical (0.95) Value	0.335

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.713
A-D Critical (0.95) Value	0.74
K-S Test Statistic	0.284
K-S Critical(0.95) Value	0.324

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.856
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.263
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	11
Maximum	47
Mean of Raw Data	21.16
Standard Deviation of Raw Data	13.33
Kstar	2.115
Mean of Log Transformed Data	2.904
Standard Deviation of Log Transformed Data	0.568

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.803
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.265
Lilliefors Critical (0.95) Value	0.335

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.575
A-D Critical (0.95) Value	0.711
K-S Test Statistic	0.262
K-S Critical(0.95) Value	0.313

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.233
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	2.65
Maximum	13
Mean of Raw Data	5.507
Standard Deviation of Raw Data	3.817
Kstar	1.904
Mean of Log Transformed Data	1.54
Standard Deviation of Log Transformed Data	0.589

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.78
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.308
Lilliefors Critical (0.95) Value	0.335

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.576
A-D Critical (0.95) Value	0.712
K-S Test Statistic	0.262
K-S Critical(0.95) Value	0.314

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.878
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.224
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COPPER

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	6
Minimum	15.8
Maximum	40
Mean of Raw Data	26.26
Standard Deviation of Raw Data	8.565
Kstar	6.066
Mean of Log Transformed Data	3.22
Standard Deviation of Log Transformed Data	0.344

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.202
Lilliefors Critical (0.95) Value	0.335

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.385
A-D Critical (0.95) Value	0.708
K-S Test Statistic	0.243
K-S Critical(0.95) Value	0.312

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.903
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.259
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	6730
Maximum	34000
Mean of Raw Data	15416
Standard Deviation of Raw Data	10364
Kstar	1.906
Mean of Log Transformed Data	9.477
Standard Deviation of Log Transformed Data	0.597

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.792
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.345
Lilliefors Critical (0.95) Value	0.335

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.602
A-D Critical (0.95) Value	0.712
K-S Test Statistic	0.309
K-S Critical(0.95) Value	0.314

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.885
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.272
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	9.9
Maximum	366
Mean of Raw Data	80.45
Standard Deviation of Raw Data	127.5
Kstar	0.552
Mean of Log Transformed Data	3.644
Standard Deviation of Log Transformed Data	1.22

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.399
Lilliefors Critical (0.95) Value	0.335

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.611
A-D Critical (0.95) Value	0.734
K-S Test Statistic	0.269
K-S Critical(0.95) Value	0.322

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.924
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.18
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MAGNESIUM

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	1290
Maximum	74800
Mean of Raw Data	38363
Standard Deviation of Raw Data	33377
Kstar	0.606
Mean of Log Transformed Data	9.9
Standard Deviation of Log Transformed Data	1.53

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.822
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.255
Lilliefors Critical (0.95) Value	0.335

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.444
A-D Critical (0.95) Value	0.731
K-S Test Statistic	0.262
K-S Critical(0.95) Value	0.321

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.222
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	83.7
Maximum	550
Mean of Raw Data	204.2
Standard Deviation of Raw Data	172
Kstar	1.397
Mean of Log Transformed Data	5.084
Standard Deviation of Log Transformed Data	0.69

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.734
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.373
Lilliefors Critical (0.95) Value	0.335

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.734
A-D Critical (0.95) Value	0.714
K-S Test Statistic	0.357
K-S Critical(0.95) Value	0.315

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.847
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.32
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MERCURY

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	0.019
Maximum	0.49
Mean of Raw Data	0.167
Standard Deviation of Raw Data	0.166
Kstar	0.716
Mean of Log Transformed Data	-2.314
Standard Deviation of Log Transformed Data	1.217

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.871
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.185
Lilliefors Critical (0.95) Value	0.335

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.214
A-D Critical (0.95) Value	0.726
K-S Test Statistic	0.173
K-S Critical(0.95) Value	0.319

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.17
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NICKEL

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	6.7
Maximum	33
Mean of Raw Data	14.8
Standard Deviation of Raw Data	9.438
Kstar	1.989
Mean of Log Transformed Data	2.536
Standard Deviation of Log Transformed Data	0.597

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.196
Lilliefors Critical (0.95) Value	0.335

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.343
A-D Critical (0.95) Value	0.711
K-S Test Statistic	0.229
K-S Critical(0.95) Value	0.313

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.923
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.213
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

POTASSIUM

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	378
Maximum	4500
Mean of Raw Data	1512
Standard Deviation of Raw Data	1363
Kstar	1.292
Mean of Log Transformed Data	7.064
Standard Deviation of Log Transformed Data	0.742

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.699
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.39
Lilliefors Critical (0.95) Value	0.335

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.565
A-D Critical (0.95) Value	0.715
K-S Test Statistic	0.308
K-S Critical(0.95) Value	0.315

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.261
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

VANADIUM

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	11.6
Maximum	91
Mean of Raw Data	27.94
Standard Deviation of Raw Data	28.42
Kstar	1.205
Mean of Log Transformed Data	3.051
Standard Deviation of Log Transformed Data	0.714

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.629
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.342
Lilliefors Critical (0.95) Value	0.335

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.845
A-D Critical (0.95) Value	0.716
K-S Test Statistic	0.291
K-S Critical(0.95) Value	0.315

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.817
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.245
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4a
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ZINC

Raw Statistics

Number of Valid Samples	7
Number of Unique Samples	7
Minimum	24.5
Maximum	152
Mean of Raw Data	69.16
Standard Deviation of Raw Data	50.65
Kstar	1.525
Mean of Log Transformed Data	4.024
Standard Deviation of Log Transformed Data	0.69

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.81
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.294
Lilliefors Critical (0.95) Value	0.335

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.484
A-D Critical (0.95) Value	0.714
K-S Test Statistic	0.233
K-S Critical(0.95) Value	0.314

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical (0.95) Value	0.803
Lilliefors Test Statistic	0.195
Lilliefors Critical (0.95) Value	0.335

Data appear Lognormal at (0.05) Significance Level

Table C.10-4b
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

CADMIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
CADMIUM Data	7	0	7	6	1	14.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	6	0.03	0.31	0.155	0.15	0.106
Statistics (All: NDs treated as DL value)	7	0.03	0.31	0.137	0.13	0.107
Statistics (All: NDs treated as DL/2 value)	7	0.015	0.31	0.135	0.13	0.11
Statistics (Normal ROS Estimated Data)	7	-0.116	0.31	0.116	0.13	0.141
Statistics (Gamma ROS Estimated Data)	7	0.0013	0.31	0.133	0.13	0.112
Statistics (Lognormal ROS Estimated Data)	7	0.0132	0.31	0.134	0.13	0.11

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	2.004	1.24	0.0771	-2.137	0.886	-0.415
Statistics (NDs = DL)	1.604	1.012	0.0853	-2.333	0.96	-0.412
Statistics (NDs = DL/2)	1.314	0.846	0.102	-2.432	1.123	-0.462
Statistics (Gamma ROS Estimates)	0.783	0.542	0.169	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.45	1.157	-0.472

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.967	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.155	0.362	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.913	0.803	Data Appear Normal
Lilliefors (NDs = DL)	0.2	0.335	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.936	0.803	Data Appear Normal
Lilliefors (NDs = DL/2)	0.189	0.335	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.987	0.803	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.128	0.335	Data Appear Normal

Table C.10-4b
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.225	0.704	
Kolmogorov-Smirnov (Detects Only)	0.168	0.336	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.339	0.72	
Kolmogorov-Smirnov (NDs = DL)	0.183	0.317	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.24	0.724	
Kolmogorov-Smirnov (NDs = DL/2)	0.172	0.318	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.323	0.735	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.214	0.322	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.936	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.21	0.362	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.896	0.803	Data Appear Lognormal
Lilliefors (NDs = DL)	0.191	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.933	0.803	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.208	0.335	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.933	0.803	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.21	0.335	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4b
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SELENIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SELENIUM Data	7	0	7	5	2	28.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.31	0.32	0.315	0.315	0.00707
Statistics (Detects Only)	5	0.25	1.1	0.638	0.61	0.303
Statistics (All: NDs treated as DL value)	7	0.25	1.1	0.546	0.6	0.293
Statistics (All: NDs treated as DL/2 value)	7	0.155	1.1	0.501	0.6	0.341
Statistics (Normal ROS Estimated Data)	7	0.216	1.1	0.518	0.6	0.321
Statistics (Gamma ROS Estimated Data)	7	0.25	1.1	0.59	0.6	0.26
Statistics (Lognormal ROS Estimated Data)	7	0.25	1.1	0.532	0.6	0.306

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	5.053	2.982	0.126	-0.552	0.531	-0.963
Statistics (NDs = DL)	4.381	2.599	0.125	-0.724	0.524	-0.724
Statistics (NDs = DL/2)	2.323	1.423	0.216	-0.922	0.767	-0.832
Statistics (Gamma ROS Estimates)	6.264	3.674	0.0943	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.771	0.573	-0.743

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.894	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.311	0.396	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.864	0.803	Data Appear Normal
Lilliefors (NDs = DL)	0.244	0.335	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.878	0.803	Data Appear Normal
Lilliefors (NDs = DL/2)	0.209	0.335	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.851	0.803	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.226	0.335	Data Appear Normal

Table C.10-4b
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.461	0.681	
Kolmogorov-Smirnov (Detects Only)	0.305	0.358	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.431	0.71	
Kolmogorov-Smirnov (NDs = DL)	0.234	0.313	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.479	0.714	
Kolmogorov-Smirnov (NDs = DL/2)	0.263	0.315	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.404	0.71	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.24	0.313	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.88	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.331	0.396	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.916	0.803	Data Appear Lognormal
Lilliefors (NDs = DL)	0.229	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.879	0.803	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.276	0.335	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.856	0.803	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.259	0.335	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4b
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SILVER

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SILVER Data	7	0	7	5	2	28.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.08	0.09	0.085	0.085	0.00707
Statistics (Detects Only)	5	0.12	1	0.306	0.14	0.388
Statistics (All: NDs treated as DL value)	7	0.08	1	0.243	0.12	0.335
Statistics (All: NDs treated as DL/2 value)	7	0.04	1	0.231	0.12	0.342
Statistics (Normal ROS Estimated Data)	7	-0.513	1	0.072	0.12	0.51
Statistics (Gamma ROS Estimated Data)	7	0.0205	1	0.224	0.12	0.346
Statistics (Lognormal ROS Estimated Data)	7	0.0262	1	0.226	0.12	0.345

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.286	0.83	0.238	-1.621	0.911	-0.562
Statistics (NDs = DL)	1.259	0.814	0.193	-1.862	0.852	-0.457
Statistics (NDs = DL/2)	0.975	0.652	0.237	-2.061	1.058	-0.513
Statistics (Gamma ROS Estimates)	0.771	0.536	0.291	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.198	1.235	-0.562

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.582	0.762	Data Not Normal
Lilliefors (Detects Only)	0.456	0.396	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.525	0.803	Data Not Normal
Lilliefors (NDs = DL)	0.466	0.335	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.571	0.803	Data Not Normal
Lilliefors (NDs = DL/2)	0.45	0.335	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.843	0.803	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.296	0.335	Data Appear Normal

Table C.10-4b
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.121	0.689	
Kolmogorov-Smirnov (Detects Only)	0.46	0.363	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.344	0.724	
Kolmogorov-Smirnov (NDs = DL)	0.433	0.318	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.878	0.728	
Kolmogorov-Smirnov (NDs = DL/2)	0.375	0.32	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.695	0.735	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.332	0.322	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.644	0.762	Data Not Lognormal
Lilliefors (Detects Only)	0.419	0.396	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.704	0.803	Data Not Lognormal
Lilliefors (NDs = DL)	0.373	0.335	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.853	0.803	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.296	0.335	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.869	0.803	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.261	0.335	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4b
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

THALLIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
THALLIUM Data	6	0	6	3	3	50.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.25	0.28	0.263	0.26	0.0153
Statistics (Detects Only)	3	0.35	0.59	0.443	0.39	0.129
Statistics (All: NDs treated as DL value)	6	0.25	0.59	0.353	0.315	0.128
Statistics (All: NDs treated as DL/2 value)	6	0.125	0.59	0.288	0.245	0.189
Statistics (Normal ROS Estimated Data)	6	0.0325	0.59	0.238	0.191	0.239
Statistics (Gamma ROS Estimated Data)	6	0	0.59	0.222	0.175	0.256
Statistics (Lognormal ROS Estimated Data)	6	0.177	0.59	0.31	0.264	0.167

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	19.21	9.716	0.0231	-0.84	0.276	-0.328
Statistics (NDs = DL)	10.75	5.487	0.0329	-1.088	0.325	-0.299
Statistics (NDs = DL/2)	2.821	1.521	0.102	-1.434	0.675	-0.471
Statistics (Gamma ROS Estimates)	0.0888	0.156	2.495	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.285	0.518	-0.403

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.871	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.328	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.831	0.788	Data Appear Normal
Lilliefors (NDs = DL)	0.221	0.362	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.852	0.788	Data Appear Normal
Lilliefors (NDs = DL/2)	0.282	0.362	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.827	0.788	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.305	0.362	Data Appear Normal

Table C.10-4b
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.406	N/A	
Kolmogorov-Smirnov (Detects Only)	0.349	N/A	
Anderson-Darling (NDs = DL)	0.424	0.698	
Kolmogorov-Smirnov (NDs = DL)	0.236	0.332	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.546	0.702	
Kolmogorov-Smirnov (NDs = DL/2)	0.308	0.335	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.239	0.847	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.369	0.37	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.897	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.311	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.891	0.788	Data Appear Lognormal
Lilliefors (NDs = DL)	0.216	0.362	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.843	0.788	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.285	0.362	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.828	0.788	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.305	0.362	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4b
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SODIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SODIUM Data	7	0	7	6	1	14.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	6	1.07	358	201.7	227.5	135.5
Statistics (All: NDs treated as DL value)	7	1.07	358	175.6	170	141.7
Statistics (All: NDs treated as DL/2 value)	7	1.07	358	174.2	170	143.5
Statistics (Normal ROS Estimated Data)	7	-7.544	358	171.8	170	146.8
Statistics (Gamma ROS Estimated Data)	7	1.07	358	183.7	170	132.6
Statistics (Lognormal ROS Estimated Data)	7	1.07	358	173.5	170	144.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.747	0.522	269.8	4.505	2.223	0.493
Statistics (NDs = DL)	0.684	0.486	256.5	4.282	2.113	0.494
Statistics (NDs = DL/2)	0.628	0.454	277.3	4.183	2.201	0.526
Statistics (Gamma ROS Estimates)	0.808	0.557	227.3	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	4.065	2.34	0.575

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.945	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.231	0.362	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.917	0.803	Data Appear Normal
Lilliefors (NDs = DL)	0.209	0.335	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.91	0.803	Data Appear Normal
Lilliefors (NDs = DL/2)	0.209	0.335	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.91	0.803	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.208	0.335	Data Appear Normal

Table C.10-4b
Goodness of Fit - SWMU 71 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.767	0.721	
Kolmogorov-Smirnov (Detects Only)	0.278	0.344	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	0.52	0.74	
Kolmogorov-Smirnov (NDs = DL)	0.225	0.324	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.576	0.744	
Kolmogorov-Smirnov (NDs = DL/2)	0.229	0.325	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.619	0.734	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.239	0.322	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.676	0.788	Data Not Lognormal
Lilliefors (Detects Only)	0.351	0.362	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.79	0.803	Data Not Lognormal
Lilliefors (NDs = DL)	0.275	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.797	0.803	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.29	0.335	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.78	0.803	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.306	0.335	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

ALUMINUM

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	15
Minimum	3460
Maximum	69000
Mean of Raw Data	29418
Standard Deviation of Raw Data	19879
Kstar	1.26
Mean of Log Transformed Data	9.92
Standard Deviation of Log Transformed Data	1.031

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.177
Lilliefors Critical (0.95) Value	0.222

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.023
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.272
K-S Critical(0.95) Value	0.219

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.832
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.295
Lilliefors Critical (0.95) Value	0.222

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	15
Minimum	0.32
Maximum	16.1
Mean of Raw Data	5.692
Standard Deviation of Raw Data	4.883
Kstar	1.127
Mean of Log Transformed Data	1.32
Standard Deviation of Log Transformed Data	1.063

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.856
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.195
Lilliefors Critical (0.95) Value	0.222

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.232
A-D Critical (0.95) Value	0.758
K-S Test Statistic	0.105
K-S Critical(0.95) Value	0.22

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.15
Lilliefors Critical (0.95) Value	0.222

Data appear Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BARIUM

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	16
Minimum	51.3
Maximum	139
Mean of Raw Data	86.24
Standard Deviation of Raw Data	23.89
Kstar	11.42
Mean of Log Transformed Data	4.421
Standard Deviation of Log Transformed Data	0.279

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.968
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.103
Lilliefors Critical (0.95) Value	0.222

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.154
A-D Critical (0.95) Value	0.738
K-S Test Statistic	0.093
K-S Critical(0.95) Value	0.215

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.979
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.102
Lilliefors Critical (0.95) Value	0.222

Data appear Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BERYLLIUM

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	15
Minimum	0.29
Maximum	3.2
Mean of Raw Data	1.588
Standard Deviation of Raw Data	0.93
Kstar	1.825
Mean of Log Transformed Data	0.218
Standard Deviation of Log Transformed Data	0.813

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.158
Lilliefors Critical (0.95) Value	0.222

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.755
A-D Critical (0.95) Value	0.749
K-S Test Statistic	0.182
K-S Critical(0.95) Value	0.218

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.858
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.216
Lilliefors Critical (0.95) Value	0.222

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CALCIUM

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	16
Minimum	1100
Maximum	172000
Mean of Raw Data	34791
Standard Deviation of Raw Data	64971
Kstar	0.365
Mean of Log Transformed Data	8.8
Standard Deviation of Log Transformed Data	1.768

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.542
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.414
Lilliefors Critical (0.95) Value	0.222

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	2.123
A-D Critical (0.95) Value	0.818
K-S Test Statistic	0.302
K-S Critical(0.95) Value	0.23

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.813
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.232
Lilliefors Critical (0.95) Value	0.222

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	14
Minimum	11
Maximum	66
Mean of Raw Data	41.74
Standard Deviation of Raw Data	20.6
Kstar	2.466
Mean of Log Transformed Data	3.555
Standard Deviation of Log Transformed Data	0.686

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.208
Lilliefors Critical (0.95) Value	0.222

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.3
A-D Critical (0.95) Value	0.744
K-S Test Statistic	0.267
K-S Critical(0.95) Value	0.217

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.787
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.28
Lilliefors Critical (0.95) Value	0.222

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	16
Minimum	2.65
Maximum	22
Mean of Raw Data	8.488
Standard Deviation of Raw Data	5.035
Kstar	2.661
Mean of Log Transformed Data	1.976
Standard Deviation of Log Transformed Data	0.604

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.884
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.194
Lilliefors Critical (0.95) Value	0.222

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.404
A-D Critical (0.95) Value	0.744
K-S Test Statistic	0.171
K-S Critical(0.95) Value	0.217

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.209
Lilliefors Critical (0.95) Value	0.222

Data appear Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COPPER

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	13
Minimum	6.4
Maximum	39.1
Mean of Raw Data	23.82
Standard Deviation of Raw Data	7.764
Kstar	6.245
Mean of Log Transformed Data	3.103
Standard Deviation of Log Transformed Data	0.417

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.979
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.111
Lilliefors Critical (0.95) Value	0.222

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.495
A-D Critical (0.95) Value	0.74
K-S Test Statistic	0.145
K-S Critical(0.95) Value	0.215

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.849
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.164
Lilliefors Critical (0.95) Value	0.222

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	16
Minimum	6730
Maximum	62000
Mean of Raw Data	32776
Standard Deviation of Raw Data	18943
Kstar	1.959
Mean of Log Transformed Data	10.17
Standard Deviation of Log Transformed Data	0.765

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.176
Lilliefors Critical (0.95) Value	0.222

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.814
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.192
K-S Critical(0.95) Value	0.217

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.863
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.197
Lilliefors Critical (0.95) Value	0.222

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	15
Minimum	1.3
Maximum	366
Mean of Raw Data	43.23
Standard Deviation of Raw Data	90.71
Kstar	0.528
Mean of Log Transformed Data	2.734
Standard Deviation of Log Transformed Data	1.327

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.471
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.367
Lilliefors Critical (0.95) Value	0.222

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.501
A-D Critical (0.95) Value	0.788
K-S Test Statistic	0.267
K-S Critical(0.95) Value	0.226

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.202
Lilliefors Critical (0.95) Value	0.222

Data appear Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MAGNESIUM

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	13
Minimum	1290
Maximum	74800
Mean of Raw Data	38266
Standard Deviation of Raw Data	23950
Kstar	1.245
Mean of Log Transformed Data	10.18
Standard Deviation of Log Transformed Data	1.136

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.117
Lilliefors Critical (0.95) Value	0.222

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.812
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.249
K-S Critical(0.95) Value	0.219

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.808
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.296
Lilliefors Critical (0.95) Value	0.222

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	16
Minimum	83.7
Maximum	550
Mean of Raw Data	300
Standard Deviation of Raw Data	151.3
Kstar	2.719
Mean of Log Transformed Data	5.544
Standard Deviation of Log Transformed Data	0.629

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.176
Lilliefors Critical (0.95) Value	0.222

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.764
A-D Critical (0.95) Value	0.744
K-S Test Statistic	0.203
K-S Critical(0.95) Value	0.217

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.875
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.22
Lilliefors Critical (0.95) Value	0.222

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NICKEL

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	15
Minimum	6.7
Maximum	46
Mean of Raw Data	27.15
Standard Deviation of Raw Data	12.4
Kstar	2.787
Mean of Log Transformed Data	3.146
Standard Deviation of Log Transformed Data	0.649

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.886
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.238
Lilliefors Critical (0.95) Value	0.222

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	1.34
A-D Critical (0.95) Value	0.743
K-S Test Statistic	0.285
K-S Critical(0.95) Value	0.216

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.786
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.291
Lilliefors Critical (0.95) Value	0.222

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

POTASSIUM

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	15
Minimum	378
Maximum	6900
Mean of Raw Data	3605
Standard Deviation of Raw Data	2227
Kstar	1.653
Mean of Log Transformed Data	7.917
Standard Deviation of Log Transformed Data	0.865

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.164
Lilliefors Critical (0.95) Value	0.222

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.651
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.212
K-S Critical(0.95) Value	0.218

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.885
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.22
Lilliefors Critical (0.95) Value	0.222

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

VANADIUM

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	16
Minimum	11.6
Maximum	130
Mean of Raw Data	59.48
Standard Deviation of Raw Data	36.8
Kstar	1.7
Mean of Log Transformed Data	3.821
Standard Deviation of Log Transformed Data	0.834

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.171
Lilliefors Critical (0.95) Value	0.222

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.831
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.204
K-S Critical(0.95) Value	0.218

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.237
Lilliefors Critical (0.95) Value	0.222

Data not Lognormal at (0.05) Significance Level

Table C.10-4c
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Full Data Sets
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ZINC

Raw Statistics

Number of Valid Samples	16
Number of Unique Samples	15
Minimum	24.5
Maximum	152
Mean of Raw Data	58.62
Standard Deviation of Raw Data	28.54
Kstar	5.055
Mean of Log Transformed Data	3.988
Standard Deviation of Log Transformed Data	0.404

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.751
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.231
Lilliefors Critical (0.95) Value	0.222

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.615
A-D Critical (0.95) Value	0.741
K-S Test Statistic	0.174
K-S Critical(0.95) Value	0.216

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical (0.95) Value	0.887
Lilliefors Test Statistic	0.148
Lilliefors Critical (0.95) Value	0.222

Data appear Lognormal at (0.05) Significance Level

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

ANTIMONY

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
ANTIMONY Data	16	0	16	10	6	37.50%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	6	0.036	0.49	0.251	0.233	0.237
Statistics (Detects Only)	10	0.069	16.4	1.887	0.245	5.103
Statistics (All: NDs treated as DL value)	16	0.036	16.4	1.274	0.245	4.038
Statistics (All: NDs treated as DL/2 value)	16	0.018	16.4	1.226	0.228	4.05
Statistics (Normal ROS Estimated Data)	16	-7.067	16.4	-0.0899	0.11	4.971
Statistics (Gamma ROS Estimated Data)	16	0	16.4	1.243	0.245	4.046
Statistics (Lognormal ROS Estimated Data)	16	0.00729	16.4	1.199	0.11	4.058

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.384	0.354	4.915	-1.091	1.534	-1.406
Statistics (NDs = DL)	0.391	0.359	3.258	-1.448	1.515	-1.046
Statistics (NDs = DL/2)	0.351	0.327	3.49	-1.708	1.657	-0.97
Statistics (Gamma ROS Estimates)	0.154	0.166	8.093	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.936	1.754	-0.906

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.397	0.842	Data Not Normal
Lilliefors (Detects Only)	0.498	0.28	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.314	0.887	Data Not Normal
Lilliefors (NDs = DL)	0.502	0.222	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.308	0.887	Data Not Normal
Lilliefors (NDs = DL/2)	0.497	0.222	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.665	0.887	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.381	0.222	Data Not Normal

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.862	0.798	
Kolmogorov-Smirnov (Detects Only)	0.409	0.285	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.338	0.819	
Kolmogorov-Smirnov (NDs = DL)	0.378	0.23	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.448	0.827	
Kolmogorov-Smirnov (NDs = DL/2)	0.353	0.231	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.02	0.896	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.328	0.24	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.799	0.842	Data Not Lognormal
Lilliefors (Detects Only)	0.245	0.28	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.87	0.887	Data Not Lognormal
Lilliefors (NDs = DL)	0.198	0.222	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.87	0.887	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.173	0.222	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.917	0.887	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.15	0.222	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CADMIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
CADMIUM Data	16	0	16	15	1	6.25%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	15	0.017	0.43	0.13	0.057	0.14
Statistics (All: NDs treated as DL value)	16	0.017	0.43	0.124	0.0475	0.138
Statistics (All: NDs treated as DL/2 value)	16	0.015	0.43	0.123	0.0475	0.139
Statistics (Normal ROS Estimated Data)	16	-0.0192	0.43	0.12	0.0475	0.141
Statistics (Gamma ROS Estimated Data)	16	0	0.43	0.122	0.0475	0.139
Statistics (Lognormal ROS Estimated Data)	16	0.017	0.43	0.123	0.0475	0.138

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.009	0.861	0.129	-2.614	1.115	-0.427
Statistics (NDs = DL)	0.999	0.853	0.124	-2.67	1.1	-0.412
Statistics (NDs = DL/2)	0.947	0.811	0.129	-2.713	1.148	-0.423
Statistics (Gamma ROS Estimates)	0.401	0.368	0.303	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.695	1.125	-0.417

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.781	0.881	Data Not Normal
Lilliefors (Detects Only)	0.283	0.229	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.759	0.887	Data Not Normal
Lilliefors (NDs = DL)	0.295	0.222	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.766	0.887	Data Not Normal
Lilliefors (NDs = DL/2)	0.291	0.222	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.8	0.887	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.284	0.222	Data Not Normal

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.842	0.763	
Kolmogorov-Smirnov (Detects Only)	0.217	0.228	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	1.047	0.763	
Kolmogorov-Smirnov (NDs = DL)	0.235	0.221	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.896	0.766	
Kolmogorov-Smirnov (NDs = DL/2)	0.221	0.222	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	1.261	0.817	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.287	0.23	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.898	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.189	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.883	0.887	Data Not Lognormal
Lilliefors (NDs = DL)	0.207	0.222	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.903	0.887	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.186	0.222	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.889	0.887	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.196	0.222	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MERCURY

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
MERCURY Data	16	0	16	15	1	6.25%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	15	0.0099	0.49	0.11	0.0615	0.124
Statistics (All: NDs treated as DL value)	16	0.0048	0.49	0.103	0.0603	0.123
Statistics (All: NDs treated as DL/2 value)	16	0.0024	0.49	0.103	0.0603	0.123
Statistics (Normal ROS Estimated Data)	16	-0.157	0.49	0.093	0.0603	0.137
Statistics (Gamma ROS Estimated Data)	16	0	0.49	0.103	0.0603	0.123
Statistics (Lognormal ROS Estimated Data)	16	0.00449	0.49	0.103	0.0603	0.123

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.106	0.94	0.0992	-2.726	1.09	-0.4
Statistics (NDs = DL)	0.941	0.806	0.11	-2.889	1.24	-0.429
Statistics (NDs = DL/2)	0.888	0.763	0.116	-2.933	1.339	-0.457
Statistics (Gamma ROS Estimates)	0.415	0.379	0.248	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.894	1.249	-0.431

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.736	0.881	Data Not Normal
Lilliefors (Detects Only)	0.225	0.229	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.733	0.887	Data Not Normal
Lilliefors (NDs = DL)	0.231	0.222	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.736	0.887	Data Not Normal
Lilliefors (NDs = DL/2)	0.231	0.222	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.846	0.887	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.21	0.222	Data Appear Normal

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.293	0.761	
Kolmogorov-Smirnov (Detects Only)	0.144	0.227	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.235	0.766	
Kolmogorov-Smirnov (NDs = DL)	0.124	0.222	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.201	0.768	
Kolmogorov-Smirnov (NDs = DL/2)	0.115	0.222	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.263	0.814	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.243	0.23	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.974	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.15	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.977	0.887	Data Appear Lognormal
Lilliefors (NDs = DL)	0.166	0.222	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.965	0.887	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.18	0.222	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.977	0.887	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.167	0.222	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SELENIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SELENIUM Data	16	0	16	14	2	12.50%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.31	0.32	0.315	0.315	0.00707
Statistics (Detects Only)	14	0.15	2	0.705	0.533	0.618
Statistics (All: NDs treated as DL value)	16	0.15	2	0.656	0.393	0.59
Statistics (All: NDs treated as DL/2 value)	16	0.15	2	0.636	0.393	0.605
Statistics (Normal ROS Estimated Data)	16	0.15	2	0.636	0.393	0.605
Statistics (Gamma ROS Estimated Data)	16	0.15	2	0.648	0.393	0.595
Statistics (Lognormal ROS Estimated Data)	16	0.15	2	0.645	0.393	0.598

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.711	1.432	0.412	-0.67	0.822	-1.227
Statistics (NDs = DL)	1.767	1.477	0.371	-0.731	0.783	-1.071
Statistics (NDs = DL/2)	1.515	1.272	0.42	-0.817	0.865	-1.058
Statistics (Gamma ROS Estimates)	1.692	1.416	0.383	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.772	0.814	-1.055

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.786	0.874	Data Not Normal
Lilliefors (Detects Only)	0.275	0.237	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.75	0.887	Data Not Normal
Lilliefors (NDs = DL)	0.281	0.222	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.76	0.887	Data Not Normal
Lilliefors (NDs = DL/2)	0.267	0.222	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.76	0.887	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.267	0.222	Data Not Normal

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.493	0.749	
Kolmogorov-Smirnov (Detects Only)	0.184	0.232	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.758	0.752	
Kolmogorov-Smirnov (NDs = DL)	0.222	0.218	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.63	0.755	
Kolmogorov-Smirnov (NDs = DL/2)	0.182	0.219	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.766	0.753	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.209	0.219	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.949	0.874	Data Appear Lognormal
Lilliefors (Detects Only)	0.145	0.237	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.933	0.887	Data Appear Lognormal
Lilliefors (NDs = DL)	0.199	0.222	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.925	0.887	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.145	0.222	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.929	0.887	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.174	0.222	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SILVER

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SILVER Data	16	0	16	12	4	25.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	0.08	0.09	0.0875	0.09	0.005
Statistics (Detects Only)	12	0.12	1.3	0.321	0.16	0.394
Statistics (All: NDs treated as DL value)	16	0.08	1.3	0.263	0.14	0.353
Statistics (All: NDs treated as DL/2 value)	16	0.04	1.3	0.252	0.14	0.359
Statistics (Normal ROS Estimated Data)	16	-0.609	1.3	0.131	0.14	0.482
Statistics (Gamma ROS Estimated Data)	16	0	1.3	0.248	0.14	0.362
Statistics (Lognormal ROS Estimated Data)	16	0.0262	1.3	0.251	0.14	0.36

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.364	1.15	0.235	-1.546	0.805	-0.521
Statistics (NDs = DL)	1.3	1.098	0.202	-1.769	0.797	-0.451
Statistics (NDs = DL/2)	1.024	0.873	0.246	-1.942	0.989	-0.509
Statistics (Gamma ROS Estimates)	0.374	0.346	0.661	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.974	1.038	-0.526

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.551	0.859	Data Not Normal
Lilliefors (Detects Only)	0.454	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.515	0.887	Data Not Normal
Lilliefors (NDs = DL)	0.445	0.222	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.554	0.887	Data Not Normal
Lilliefors (NDs = DL/2)	0.432	0.222	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.832	0.887	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.318	0.222	Data Not Normal

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.201	0.749	
Kolmogorov-Smirnov (Detects Only)	0.418	0.25	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.458	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.373	0.22	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.607	0.763	
Kolmogorov-Smirnov (NDs = DL/2)	0.329	0.221	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.808	0.822	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.325	0.231	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.676	0.859	Data Not Lognormal
Lilliefors (Detects Only)	0.365	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.743	0.887	Data Not Lognormal
Lilliefors (NDs = DL)	0.296	0.222	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.858	0.887	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.243	0.222	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.894	0.887	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.238	0.222	Data Not Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SODIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
SODIUM Data	16	0	16	10	6	37.50%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	6	19	19	19	19	N/A
Statistics (Detects Only)	10	1.07	358	195.8	208	112.7
Statistics (All: NDs treated as DL value)	16	1.07	358	129.5	86	124.2
Statistics (All: NDs treated as DL/2 value)	16	1.07	358	125.9	86	127.7
Statistics (Normal ROS Estimated Data)	16	-138.4	358	112.9	91.08	147.1
Statistics (Gamma ROS Estimated Data)	16	1.07	358	175.6	178.2	96.92
Statistics (Lognormal ROS Estimated Data)	16	1.07	358	125.5	86	128.1

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.062	0.905	184.3	4.738	1.735	0.366
Statistics (NDs = DL)	0.75	0.651	172.8	4.065	1.616	0.397
Statistics (NDs = DL/2)	0.6	0.529	210.1	3.805	1.831	0.481
Statistics (Gamma ROS Estimates)	1.476	1.241	119	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.635	2.07	0.569

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.968	0.842	Data Appear Normal
Lilliefors (Detects Only)	0.116	0.28	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.846	0.887	Data Not Normal
Lilliefors (NDs = DL)	0.251	0.222	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.839	0.887	Data Not Normal
Lilliefors (NDs = DL/2)	0.257	0.222	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.966	0.887	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.14	0.222	Data Appear Normal

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.023	0.747	
Kolmogorov-Smirnov (Detects Only)	0.275	0.273	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.916	0.775	
Kolmogorov-Smirnov (NDs = DL)	0.239	0.223	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.103	0.788	
Kolmogorov-Smirnov (NDs = DL/2)	0.266	0.226	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.936	0.755	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.197	0.219	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.638	0.842	Data Not Lognormal
Lilliefors (Detects Only)	0.315	0.28	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.85	0.887	Data Not Lognormal
Lilliefors (NDs = DL)	0.194	0.222	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.845	0.887	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.239	0.222	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.874	0.887	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.214	0.222	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

THALLIUM

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
THALLIUM Data	12	0	12	11	1	8.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	11	0.19	0.59	0.325	0.34	0.118
Statistics (All: NDs treated as DL value)	12	0.19	0.59	0.318	0.3	0.114
Statistics (All: NDs treated as DL/2 value)	12	0.125	0.59	0.308	0.3	0.126
Statistics (Normal ROS Estimated Data)	12	0.19	0.59	0.313	0.3	0.119
Statistics (Gamma ROS Estimated Data)	12	0.19	0.59	0.315	0.3	0.117
Statistics (Lognormal ROS Estimated Data)	12	0.19	0.59	0.314	0.3	0.118

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	9.167	6.931	0.0354	-1.181	0.345	-0.292
Statistics (NDs = DL)	9.539	7.21	0.0334	-1.198	0.334	-0.279
Statistics (NDs = DL/2)	6.587	4.996	0.0467	-1.256	0.419	-0.334
Statistics (Gamma ROS Estimates)	8.934	6.756	0.0353	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.215	0.35	-0.288

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.909	0.85	Data Appear Normal
Lilliefors (Detects Only)	0.163	0.267	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.893	0.859	Data Appear Normal
Lilliefors (NDs = DL)	0.195	0.256	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.949	0.859	Data Appear Normal
Lilliefors (NDs = DL/2)	0.148	0.256	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.892	0.859	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.173	0.256	Data Appear Normal

Table C.10-4d
Goodness of Fit - SWMU 71 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.289	0.73	
Kolmogorov-Smirnov (Detects Only)	0.158	0.255	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.343	0.73	
Kolmogorov-Smirnov (NDs = DL)	0.19	0.245	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.189	0.731	
Kolmogorov-Smirnov (NDs = DL/2)	0.151	0.246	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.392	0.731	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.172	0.245	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.958	0.85	Data Appear Lognormal
Lilliefors (Detects Only)	0.162	0.267	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.954	0.859	Data Appear Lognormal
Lilliefors (NDs = DL)	0.172	0.256	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.981	0.859	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.164	0.256	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.94	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.152	0.256	Data Appear Lognormal

Note: DL/2 is not a recommended method.

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ALUMINUM(site)

Background Data: ALUMINUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	28
Number of Distinct Samples	19	28
Minimum	659	3620
Maximum	28500	20100
Mean	14470	8300
Median	14500	6705
SD	6219	4279
SE of Mean	1427	808.6

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	615.5
WMW Test U-Stat	425.5
WMW Critical Value (0.050)	401
Approximate P-Value	0.00028367

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ARSENIC(site)

Background Data: ARSENIC(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	28
Number of Distinct Samples	17	24
Minimum	1.3	1.5
Maximum	55	10.2
Mean	9.944	3.732
Median	4.5	2.75
SD	15.67	2.33
SE of Mean	3.595	0.44

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	579
WMW Test U-Stat	389
WMW Critical Value (0.050)	401
Approximate P-Value	0.00396

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: BARIUM(site)

Background Data: BARIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	28
Number of Non-Detect Data	0	4
Number of Detect Data	19	24
Minimum Non-Detect	N/A	0.36
Maximum Non-Detect	N/A	1
Percent Non detects	0.00%	14.29%
Minimum Detected	14.6	23.4
Maximum Detected	191	174
Mean of Detected Data	70.2	75.55
Median of Detected Data	57	61.85
SD of Detected Data	43.4	43.2

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	476.5
WMW Test U-Stat	286.5
WMW Critical Value (0.050)	401
Approximate P-Value	0.332

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: BERYLLIUM(site)

Background Data: BERYLLIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	28
Number of Non-Detect Data	0	13
Number of Detect Data	19	15
Minimum Non-Detect	N/A	0.022
Maximum Non-Detect	N/A	0.03
Percent Non detects	0.00%	46.43%
Minimum Detected	0.24	0.61
Maximum Detected	1.5	1.5
Mean of Detected Data	0.646	0.887
Median of Detected Data	0.54	0.87
SD of Detected Data	0.311	0.246

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.03 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	500.5
WMW Test U-Stat	310.5
WMW Critical Value (0.050)	401
Approximate P-Value	0.17

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: CALCIUM(site)

Background Data: CALCIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	27
Number of Non-Detect Data	0	5
Number of Detect Data	19	22
Minimum Non-Detect	N/A	4.6
Maximum Non-Detect	N/A	6.6
Percent Non detects	0.00%	18.52%
Minimum Detected	457	116
Maximum Detected	26300	2200
Mean of Detected Data	6453	917.5
Median of Detected Data	4100	855
SD of Detected Data	6343	540.4

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 6.6 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	672
WMW Test U-Stat	482
WMW Critical Value (0.050)	382
Approximate P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
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Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: COBALT(site)

Background Data: COBALT(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	27
Number of Non-Detect Data	0	8
Number of Detect Data	19	19
Minimum Non-Detect	N/A	0.11
Maximum Non-Detect	N/A	0.75
Percent Non detects	0.00%	29.63%
Minimum Detected	1.8	5.9
Maximum Detected	13.2	33.6
Mean of Detected Data	6.771	14.39
Median of Detected Data	6.6	11.9
SD of Detected Data	2.634	7.506

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.75 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	386
WMW Test U-Stat	196
WMW Critical Value (0.050)	382
Approximate P-Value	0.913

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean Less Than or Equal to Background Mean (Form 1)
Alternative Hypothesis	Site or AOC Mean Greater Than the Background Mean

Area of Concern Data: CHROMIUM(site)

Background Data: CHROMIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	27
Number of Distinct Samples	19	26
Minimum	4.1	6.3
Maximum	37.6	34.4
Mean	22.86	19.9
Median	22.7	22.3
SD	7.771	8.556
SE of Mean	1.783	1.647

Site vs Background Two-Sample t-Test

H0: Mu of Site - Mu of Background <= 0

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	44	1.2	1.68	0.118
Satterthwaite (Unequal Variance)	41.1	1.221	1.683	0.115

Pooled SD 8.243

Conclusion with Alpha = 0.050

* Student t (Pooled) Test: Do Not Reject H0, Conclude Site <= Background
* Satterthwaite Test: Do Not Reject H0, Conclude Site <= Background

Test of Equality of Variances

Numerator DF	Denominator DF	F-Test Value	P-Value
26	18	1.212	0.682

Conclusion with Alpha = 0.05

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

* Two variances appear to be equal

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: COPPER(site)

Background Data: COPPER(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	28
Number of Non-Detect Data	1	2
Number of Detect Data	18	26
Minimum Non-Detect	0.16	0.17
Maximum Non-Detect	0.16	0.17
Percent Non detects	5.26%	7.14%
Minimum Detected	2.1	2.2
Maximum Detected	76	13.6
Mean of Detected Data	19.99	6.919
Median of Detected Data	11.8	5.35
SD of Detected Data	20.16	3.696

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.17 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	570.5
WMW Test U-Stat	380.5
WMW Critical Value (0.050)	401
Approximate P-Value	0.00673

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: IRON(site)

Background Data: IRON(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	27
Number of Distinct Samples	17	25
Minimum	1440	7250
Maximum	32000	33700
Mean	22272	18519
Median	23900	19400
SD	7844	8539
SE of Mean	1800	1643

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	528.5
WMW Test U-Stat	338.5
WMW Critical Value (0.050)	382
Approximate P-Value	0.0345

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: LEAD(site)

Background Data: LEAD(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	25
Number of Distinct Samples	17	23
Minimum	3.8	8.9
Maximum	110	28.8
Mean	27.45	16.05
Median	19.5	14.7
SD	26.53	5.967
SE of Mean	6.087	1.193

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	525.5
WMW Test U-Stat	335.5
WMW Critical Value (0.050)	344
Approximate P-Value	0.0104

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: MAGNESIUM(site)

Background Data: MAGNESIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	27
Number of Non-Detect Data	0	3
Number of Detect Data	19	24
Minimum Non-Detect	N/A	4.7
Maximum Non-Detect	N/A	5
Percent Non detects	0.00%	11.11%
Minimum Detected	120	158
Maximum Detected	24400	8080
Mean of Detected Data	5623	1752
Median of Detected Data	3950	852.5
SD of Detected Data	5942	2254

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 5 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	601.5
WMW Test U-Stat	411.5
WMW Critical Value (0.050)	382
Approximate P-Value	0.00028367

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: MANGANESE(site)

Background Data: MANGANESE(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	28
Number of Distinct Samples	18	28
Minimum	10.7	43
Maximum	894	2040
Mean	333.9	695.9
Median	318	490
SD	206.9	591.5
SE of Mean	47.48	111.8

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	355.5
WMW Test U-Stat	165.5
WMW Critical Value (0.050)	401
Approximate P-Value	0.986

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: NICKEL(site)

Background Data: NICKEL(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	28
Number of Non-Detect Data	0	11
Number of Detect Data	19	17
Minimum Non-Detect	N/A	0.21
Maximum Non-Detect	N/A	1.3
Percent Non detects	0.00%	39.29%
Minimum Detected	4.3	4.6
Maximum Detected	20.9	18.1
Mean of Detected Data	9.895	9.935
Median of Detected Data	7.4	9.4
SD of Detected Data	5.025	4.294

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1.3 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	555
WMW Test U-Stat	365
WMW Critical Value (0.050)	401
Approximate P-Value	0.0164

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: POTASSIUM(site)

Background Data: POTASSIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	28
Number of Non-Detect Data	0	6
Number of Detect Data	19	22
Minimum Non-Detect	N/A	201
Maximum Non-Detect	N/A	271
Percent Non detects	0.00%	21.43%
Minimum Detected	89.2	166
Maximum Detected	5240	2350
Mean of Detected Data	1214	735.4
Median of Detected Data	1020	509.5
SD of Detected Data	1079	632.6

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 271 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	583.5
WMW Test U-Stat	393.5
WMW Critical Value (0.050)	401
Approximate P-Value	0.00295

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: VANADIUM(site)

Background Data: VANADIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	27
Number of Distinct Samples	18	26
Minimum	5.4	12.2
Maximum	56.9	52.9
Mean	39.97	31.4
Median	43.5	32.6
SD	15.37	12.19
SE of Mean	3.527	2.347

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	562.5
WMW Test U-Stat	372.5
WMW Critical Value (0.050)	382
Approximate P-Value	0.00499

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

C.10-5a
Background Versus Site Means Comparison - SWMU 40 Surface Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ZINC(site)

Background Data: ZINC(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	19	27
Number of Distinct Samples	19	27
Minimum	5.5	7.1
Maximum	148	94.1
Mean	59.84	34.74
Median	42.9	29.2
SD	40.55	21.52
SE of Mean	9.303	4.142

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	550
WMW Test U-Stat	360
WMW Critical Value (0.050)	382
Approximate P-Value	0.0108

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

C.10-5b
Background Versus Site Means Comparison - SWMU 40 Total Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ALUMINUM(site)

Background Data: ALUMINUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	76
Number of Distinct Samples	49	72
Minimum	659	3620
Maximum	47500	33900
Mean	18223	12977
Median	16000	11850
SD	9516	7223
SE of Mean	1333	828.6

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	3978
WMW Test U-Stat	3.507
WMW Critical Value (0.050)	1.645
P-Value	0.00022696

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ARSENIC(site)

Background Data: ARSENIC(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	69
Number of Non-Detect Data	1	3
Number of Detect Data	50	66
Minimum Non-Detect	0.27	0.09
Maximum Non-Detect	0.27	0.12
Percent Non detects	1.96%	4.35%
Minimum Detected	1.3	1.2
Maximum Detected	74.6	7.6
Mean of Detected Data	10.72	3.276
Median of Detected Data	5	2.9
SD of Detected Data	16.55	1.484

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.27 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	4017
WMW Test U-Stat	4.94
WMW Critical Value (0.050)	1.645
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: BARIUM(site)

Background Data: BARIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	79
Number of Non-Detect Data	0	16
Number of Detect Data	51	63
Minimum Non-Detect	N/A	0.36
Maximum Non-Detect	N/A	1.1
Percent Non detects	0.00%	20.25%
Minimum Detected	14.6	23.4
Maximum Detected	250	174
Mean of Detected Data	74.67	68.4
Median of Detected Data	65	56.7
SD of Detected Data	40.53	40.39

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1.1 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	4047
WMW Test U-Stat	3.364
WMW Critical Value (0.050)	1.645
P-Value	0.00038414

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: BERYLLIUM(site)

Background Data: BERYLLIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	71
Number of Non-Detect Data	0	39
Number of Detect Data	51	32
Minimum Non-Detect	N/A	0.022
Maximum Non-Detect	N/A	0.03
Percent Non detects	0.00%	54.93%
Minimum Detected	0.24	0.61
Maximum Detected	3	1.6
Mean of Detected Data	0.928	1.017
Median of Detected Data	0.66	0.975
SD of Detected Data	0.653	0.272

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.03 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	3845
WMW Test U-Stat	3.675
WMW Critical Value (0.050)	1.645
P-Value	0.00011893

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: CALCIUM(site)

Background Data: CALCIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	75
Number of Non-Detect Data	0	16
Number of Detect Data	51	59
Minimum Non-Detect	N/A	4.6
Maximum Non-Detect	N/A	6.7
Percent Non detects	0.00%	21.33%
Minimum Detected	457	116
Maximum Detected	102000	2200
Mean of Detected Data	11573	774.2
Median of Detected Data	4160	709
SD of Detected Data	17796	497.4

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 6.7 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	4963
WMW Test U-Stat	8.569
WMW Critical Value (0.050)	1.645
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: CADMIUM(site)

Background Data: CADMIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	78
Number of Non-Detect Data	20	66
Number of Detect Data	31	12
Minimum Non-Detect	0.03	0.02
Maximum Non-Detect	0.05	0.05
Percent Non detects	39.22%	84.62%
Minimum Detected	0.08	0.57
Maximum Detected	7.6	2.2
Mean of Detected Data	0.76	1.04
Median of Detected Data	0.32	1.01
SD of Detected Data	1.4	0.441

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.05 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	4101
WMW Test U-Stat	3.781
WMW Critical Value (0.050)	1.645
P-Value	7.7965E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: COBALT(site)

Background Data: COBALT(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	74
Number of Non-Detect Data	0	23
Number of Detect Data	51	51
Minimum Non-Detect	N/A	0.11
Maximum Non-Detect	N/A	0.84
Percent Non detects	0.00%	31.08%
Minimum Detected	1.8	5.9
Maximum Detected	24.85	41.1
Mean of Detected Data	7.72	15.67
Median of Detected Data	7	12.9
SD of Detected Data	3.5	8.18

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.84 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2839
WMW Test U-Stat	-1.881
WMW Critical Value (0.050)	1.645
P-Value	0.97

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: CHROMIUM(site)

Background Data: CHROMIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	78
Number of Distinct Samples	45	69
Minimum	4.1	6.3
Maximum	234	53.3
Mean	33.84	26.24
Median	27.7	26
SD	31.88	11.28
SE of Mean	4.464	1.277

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	3580
WMW Test U-Stat	1.272
WMW Critical Value (0.050)	1.645
P-Value	0.102

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: COPPER(site)

Background Data: COPPER(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	50	79
Number of Non-Detect Data	1	2
Number of Detect Data	49	77
Minimum Non-Detect	0.16	0.17
Maximum Non-Detect	0.16	0.17
Percent Non detects	2.00%	2.53%
Minimum Detected	2.1	1.6
Maximum Detected	52000	38.7
Mean of Detected Data	1098	12.25
Median of Detected Data	20.9	9.1
SD of Detected Data	7424	9.397

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.17 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	4155
WMW Test U-Stat	4.37
WMW Critical Value (0.050)	1.645
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: IRON(site)

Background Data: IRON(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	78
Number of Non-Detect Data	0	0
Number of Detect Data	51	78
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	1440	7250
Maximum Detected	98100	63000
Mean of Detected Data	28215	26441
Median of Detected Data	26800	25200
SD of Detected Data	14580	11126

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	N/A
WMW Test U-Stat	N/A
WMW Critical Value (0.050)	1.645
P-Value	N/A

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: LEAD(site)

Background Data: LEAD(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	74
Number of Non-Detect Data	0	0
Number of Detect Data	51	74
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	2.4	2.1
Maximum Detected	1100	35.5
Mean of Detected Data	54.82	13.35
Median of Detected Data	19.4	11.25
SD of Detected Data	155.5	6.983

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	N/A
WMW Test U-Stat	N/A
WMW Critical Value (0.050)	1.645
P-Value	N/A

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: MAGNESIUM(site)

Background Data: MAGNESIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	70
Number of Non-Detect Data	0	7
Number of Detect Data	51	63
Minimum Non-Detect	N/A	3.8
Maximum Non-Detect	N/A	5
Percent Non detects	0.00%	10.00%
Minimum Detected	120	139
Maximum Detected	66200	9200
Mean of Detected Data	11621	2102
Median of Detected Data	7610	971
SD of Detected Data	13063	2335

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 5 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	4406
WMW Test U-Stat	6.792
WMW Critical Value (0.050)	1.645
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: MANGANESE(site)

Background Data: MANGANESE(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	73
Number of Distinct Samples	49	72
Minimum	10.7	16.7
Maximum	952	1110
Mean	364.6	362.1
Median	325	305
SD	183.2	273.1
SE of Mean	25.65	31.97

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	3331
WMW Test U-Stat	0.726
WMW Critical Value (0.050)	1.645
P-Value	0.234

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: MERCURY(site)

Background Data: MERCURY(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	78
Number of Non-Detect Data	6	61
Number of Detect Data	45	17
Minimum Non-Detect	0.019	0.019
Maximum Non-Detect	0.025	0.06
Percent Non detects	11.76%	78.21%
Minimum Detected	0.026	0.038
Maximum Detected	11	0.27
Mean of Detected Data	0.673	0.127
Median of Detected Data	0.12	0.12
SD of Detected Data	1.742	0.0561

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.06 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	4329
WMW Test U-Stat	4.88
WMW Critical Value (0.050)	1.645
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: VANADIUM(site)

Background Data: VANADIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	78
Number of Non-Detect Data	0	0
Number of Detect Data	51	78
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	5.4	12.2
Maximum Detected	95.2	101
Mean of Detected Data	44	44.97
Median of Detected Data	45	41.4
SD of Detected Data	18.37	18.97

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	N/A
WMW Test U-Stat	N/A
WMW Critical Value (0.050)	1.645
P-Value	N/A

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value < alpha (0.05)

C.10-5b
Background Versus Site Means Comparison - SWMU 40 Total Soil
ProUCL 4.0
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean Less Than or Equal to Background Mean (Form 1)
Alternative Hypothesis	Site or AOC Mean Greater Than the Background Mean

Area of Concern Data: VANADIUM(site)

Background Data: VANADIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	78
Number of Distinct Samples	49	75
Minimum	5.4	12.2
Maximum	95.2	101
Mean	44	44.97
Median	45	41.4
SD	18.37	18.97
SE of Mean	2.572	2.147

Site vs Background Two-Sample t-Test

H0: Mu of Site - Mu of Background <= 0

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	127	-0.287	1.657	0.613
Satterthwaite (Unequal Variance)	109.5	-0.289	1.659	0.613

Pooled SD 18.732

Conclusion with Alpha = 0.050

* Student t (Pooled) Test: Do Not Reject H0, Conclude Site <= Background
* Satterthwaite Test: Do Not Reject H0, Conclude Site <= Background

Test of Equality of Variances

Numerator DF	Denominator DF	F-Test Value	P-Value
77	50	1.066	0.817

Conclusion with Alpha = 0.05

* Two variances appear to be equal

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ZINC(site)

Background Data: ZINC(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	51	74
Number of Distinct Samples	51	71
Minimum	5.5	4.7
Maximum	16000	96
Mean	389.8	35.22
Median	47.5	29.3
SD	2232	23.62
SE of Mean	312.5	2.746

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	4153
WMW Test U-Stat	4.717
WMW Critical Value (0.050)	1.645
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ALUMINUM(site)

Background Data: ALUMINUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	28
Number of Distinct Samples	7	28
Minimum	3460	3620
Maximum	33000	20100
Mean	10456	8300
Median	6510	6705
SD	10571	4279
SE of Mean	3996	808.6

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	117
WMW Test U-Stat	89
WMW Critical Value (0.050)	156
Approximate P-Value	0.652

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ARSENIC(site)

Background Data: ARSENIC(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	28
Number of Distinct Samples	7	24
Minimum	4.7	1.5
Maximum	16.1	10.2
Mean	10.41	3.732
Median	9.7	2.75
SD	5.215	2.33
SE of Mean	1.971	0.44

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	207
WMW Test U-Stat	179
WMW Critical Value (0.050)	156
Approximate P-Value	0.00045047

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: BARIUM(site)

Background Data: BARIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	28
Number of Non-Detect Data	0	4
Number of Detect Data	7	24
Minimum Non-Detect	N/A	0.36
Maximum Non-Detect	N/A	1
Percent Non detects	0.00%	14.29%
Minimum Detected	51.3	23.4
Maximum Detected	180	174
Mean of Detected Data	94.91	75.55
Median of Detected Data	80	61.85
SD of Detected Data	44.22	43.2

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	167
WMW Test U-Stat	139
WMW Critical Value (0.050)	156
Approximate P-Value	0.0474

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: BERYLLIUM(site)

Background Data: BERYLLIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	28
Number of Non-Detect Data	0	13
Number of Detect Data	7	15
Minimum Non-Detect	N/A	0.022
Maximum Non-Detect	N/A	0.03
Percent Non detects	0.00%	46.43%
Minimum Detected	0.29	0.61
Maximum Detected	1.6	1.5
Mean of Detected Data	0.74	0.887
Median of Detected Data	0.68	0.87
SD of Detected Data	0.489	0.246

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.03 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	156.5
WMW Test U-Stat	128.5
WMW Critical Value (0.050)	156
Approximate P-Value	0.108

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: CALCIUM(site)

Background Data: CALCIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	27
Number of Non-Detect Data	0	5
Number of Detect Data	7	22
Minimum Non-Detect	N/A	4.6
Maximum Non-Detect	N/A	6.6
Percent Non detects	0.00%	18.52%
Minimum Detected	2610	116
Maximum Detected	172000	2200
Mean of Detected Data	77373	917.5
Median of Detected Data	18000	855
SD of Detected Data	82490	540.4

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 6.6 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	217
WMW Test U-Stat	189
WMW Critical Value (0.050)	149
Approximate P-Value	3.1189E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: COBALT(site)

Background Data: COBALT(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	27
Number of Non-Detect Data	0	8
Number of Detect Data	7	19
Minimum Non-Detect	N/A	0.11
Maximum Non-Detect	N/A	0.75
Percent Non detects	0.00%	29.63%
Minimum Detected	2.65	5.9
Maximum Detected	13	33.6
Mean of Detected Data	5.507	14.39
Median of Detected Data	3.7	11.9
SD of Detected Data	3.817	7.506

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.75 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	98.5
WMW Test U-Stat	70.5
WMW Critical Value (0.050)	149
Approximate P-Value	0.852

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean Less Than or Equal to Background Mean (Form 1)
Alternative Hypothesis	Site or AOC Mean Greater Than the Background Mean

Area of Concern Data: CHROMIUM(site)

Background Data: CHROMIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	27
Number of Distinct Samples	7	26
Minimum	11	6.3
Maximum	47	34.4
Mean	21.16	19.9
Median	14.4	22.3
SD	13.33	8.556
SE of Mean	5.04	1.647

Site vs Background Two-Sample t-Test

H0: Mu of Site - Mu of Background <= 0

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	32	0.308	1.694	0.38
Satterthwaite (Unequal Variance)	7.3	0.237	1.895	0.41

Pooled SD 9.634

Conclusion with Alpha = 0.050

* Student t (Pooled) Test: Do Not Reject H0, Conclude Site <= Background

* Satterthwaite Test: Do Not Reject H0, Conclude Site <= Background

Test of Equality of Variances

Numerator DF	Denominator DF	F-Test Value	P-Value
6	26	2.429	0.107

Conclusion with Alpha = 0.05

* Two variances appear to be equal

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: COPPER(site)

Background Data: COPPER(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	28
Number of Non-Detect Data	0	2
Number of Detect Data	7	26
Minimum Non-Detect	N/A	0.17
Maximum Non-Detect	N/A	0.17
Percent Non detects	0.00%	7.14%
Minimum Detected	15.8	2.2
Maximum Detected	40	13.6
Mean of Detected Data	26.26	6.919
Median of Detected Data	26	5.35
SD of Detected Data	8.565	3.696

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	224
WMW Test U-Stat	196
WMW Critical Value (0.050)	156
Approximate P-Value	2.8996E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: IRON(site)

Background Data: IRON(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	27
Number of Distinct Samples	7	25
Minimum	6730	7250
Maximum	34000	33700
Mean	15416	18519
Median	11100	19400
SD	10364	8539
SE of Mean	3917	1643

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	105
WMW Test U-Stat	77
WMW Critical Value (0.050)	149
Approximate P-Value	0.778

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: LEAD(site)

Background Data: LEAD(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	25
Number of Distinct Samples	7	23
Minimum	9.9	8.9
Maximum	366	28.8
Mean	80.45	16.05
Median	39.75	14.7
SD	127.5	5.967
SE of Mean	48.19	1.193

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	157.5
WMW Test U-Stat	129.5
WMW Critical Value (0.050)	135
Approximate P-Value	0.0293

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: MAGNESIUM(site)

Background Data: MAGNESIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	27
Number of Non-Detect Data	0	3
Number of Detect Data	7	24
Minimum Non-Detect	N/A	4.7
Maximum Non-Detect	N/A	5
Percent Non detects	0.00%	11.11%
Minimum Detected	1290	158
Maximum Detected	74800	8080
Mean of Detected Data	38363	1752
Median of Detected Data	30000	852.5
SD of Detected Data	33377	2254

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 5 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	207
WMW Test U-Stat	179
WMW Critical Value (0.050)	149
Approximate P-Value	0.00017331

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: MANGANESE(site)

Background Data: MANGANESE(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	28
Number of Distinct Samples	7	28
Minimum	83.7	43
Maximum	550	2040
Mean	204.2	695.9
Median	130	490
SD	172	591.5
SE of Mean	65.01	111.8

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	65
WMW Test U-Stat	37
WMW Critical Value (0.050)	156
Approximate P-Value	0.994

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: NICKEL(site)

Background Data: NICKEL(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	28
Number of Non-Detect Data	0	11
Number of Detect Data	7	17
Minimum Non-Detect	N/A	0.21
Maximum Non-Detect	N/A	1.3
Percent Non detects	0.00%	39.29%
Minimum Detected	6.7	4.6
Maximum Detected	33	18.1
Mean of Detected Data	14.8	9.935
Median of Detected Data	13	9.4
SD of Detected Data	9.438	4.294

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1.3 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	183.5
WMW Test U-Stat	155.5
WMW Critical Value (0.050)	156
Approximate P-Value	0.00937

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: POTASSIUM(site)

Background Data: POTASSIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	28
Number of Non-Detect Data	0	6
Number of Detect Data	7	22
Minimum Non-Detect	N/A	201
Maximum Non-Detect	N/A	271
Percent Non detects	0.00%	21.43%
Minimum Detected	378	166
Maximum Detected	4500	2350
Mean of Detected Data	1512	735.4
Median of Detected Data	1250	509.5
SD of Detected Data	1363	632.6

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 271 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	184
WMW Test U-Stat	156
WMW Critical Value (0.050)	156
Approximate P-Value	0.00886

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: VANADIUM(site)

Background Data: VANADIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	27
Number of Distinct Samples	7	26
Minimum	11.6	12.2
Maximum	91	52.9
Mean	27.94	31.4
Median	17.2	32.6
SD	28.42	12.19
SE of Mean	10.74	2.347

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	80
WMW Test U-Stat	52
WMW Critical Value (0.050)	149
Approximate P-Value	0.966

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ZINC(site)

Background Data: ZINC(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	7	27
Number of Distinct Samples	7	27
Minimum	24.5	7.1
Maximum	152	94.1
Mean	69.16	34.74
Median	45	29.2
SD	50.65	21.52
SE of Mean	19.15	4.142

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	168
WMW Test U-Stat	140
WMW Critical Value (0.050)	149
Approximate P-Value	0.0276

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ALUMINUM(site)

Background Data: ALUMINUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	76
Number of Distinct Samples	15	72
Minimum	3460	3620
Maximum	69000	33900
Mean	29418	12977
Median	32500	11850
SD	19879	7223
SE of Mean	4970	828.6

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	999
WMW Test U-Stat	863
WMW Critical Value (0.050)	1108
Approximate P-Value	0.00438

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ARSENIC(site)

Background Data: ARSENIC(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	69
Number of Non-Detect Data	0	3
Number of Detect Data	16	66
Minimum Non-Detect	N/A	0.09
Maximum Non-Detect	N/A	0.12
Percent Non detects	0.00%	4.35%
Minimum Detected	0.32	1.2
Maximum Detected	16.1	7.6
Mean of Detected Data	5.692	3.276
Median of Detected Data	4.6	2.9
SD of Detected Data	4.883	1.484

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.12 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	856
WMW Test U-Stat	720
WMW Critical Value (0.050)	996
Approximate P-Value	0.0298

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: BARIUM(site)

Background Data: BARIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	79
Number of Non-Detect Data	0	16
Number of Detect Data	16	63
Minimum Non-Detect	N/A	0.36
Maximum Non-Detect	N/A	1.1
Percent Non detects	0.00%	20.25%
Minimum Detected	51.3	23.4
Maximum Detected	139	174
Mean of Detected Data	86.24	68.4
Median of Detected Data	83	56.7
SD of Detected Data	23.89	40.39

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1.1 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1105
WMW Test U-Stat	968.5
WMW Critical Value (0.050)	1156
Approximate P-Value	0.00041687

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: BERYLLIUM(site)

Background Data: BERYLLIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	71
Number of Non-Detect Data	0	39
Number of Detect Data	16	32
Minimum Non-Detect	N/A	0.022
Maximum Non-Detect	N/A	0.03
Percent Non detects	0.00%	54.93%
Minimum Detected	0.29	0.61
Maximum Detected	3.2	1.6
Mean of Detected Data	1.588	1.017
Median of Detected Data	1.7	0.975
SD of Detected Data	0.93	0.272

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.03 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1099
WMW Test U-Stat	962.5
WMW Critical Value (0.050)	1028
Approximate P-Value	0

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: CALCIUM(site)

Background Data: CALCIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	75
Number of Non-Detect Data	0	16
Number of Detect Data	16	59
Minimum Non-Detect	N/A	4.6
Maximum Non-Detect	N/A	6.7
Percent Non detects	0.00%	21.33%
Minimum Detected	1100	116
Maximum Detected	172000	2200
Mean of Detected Data	34791	774.2
Median of Detected Data	3290	709
SD of Detected Data	64971	497.4

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 6.7 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1303
WMW Test U-Stat	1167
WMW Critical Value (0.050)	1092
Approximate P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: CADMIUM(site)

Background Data: CADMIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	78
Number of Non-Detect Data	1	66
Number of Detect Data	15	12
Minimum Non-Detect	0.03	0.02
Maximum Non-Detect	0.03	0.05
Percent Non detects	6.25%	84.62%
Minimum Detected	0.017	0.57
Maximum Detected	0.43	2.2
Mean of Detected Data	0.13	1.04
Median of Detected Data	0.057	1.01
SD of Detected Data	0.14	0.441

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.05 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	928
WMW Test U-Stat	792
WMW Critical Value (0.050)	1140
Approximate P-Value	0.046

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: COBALT(site)

Background Data: COBALT(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	74
Number of Non-Detect Data	0	23
Number of Detect Data	16	51
Minimum Non-Detect	N/A	0.11
Maximum Non-Detect	N/A	0.84
Percent Non detects	0.00%	31.08%
Minimum Detected	2.65	5.9
Maximum Detected	22	41.1
Mean of Detected Data	8.488	15.67
Median of Detected Data	8.2	12.9
SD of Detected Data	5.035	8.18

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.84 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	668.5
WMW Test U-Stat	532.5
WMW Critical Value (0.050)	1076
Approximate P-Value	0.737

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: CHROMIUM(site)

Background Data: CHROMIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	78
Number of Distinct Samples	14	69
Minimum	11	6.3
Maximum	66	53.3
Mean	41.74	26.24
Median	50	26
SD	20.6	11.28
SE of Mean	5.15	1.277

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1041
WMW Test U-Stat	905
WMW Critical Value (0.050)	1140
Approximate P-Value	0.00239

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: COPPER(site)

Background Data: COPPER(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	79
Number of Non-Detect Data	0	2
Number of Detect Data	16	77
Minimum Non-Detect	N/A	0.17
Maximum Non-Detect	N/A	0.17
Percent Non detects	0.00%	2.53%
Minimum Detected	6.4	1.6
Maximum Detected	39.1	38.7
Mean of Detected Data	23.82	12.25
Median of Detected Data	25.25	9.1
SD of Detected Data	7.764	9.397

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1187
WMW Test U-Stat	1051
WMW Critical Value (0.050)	1156
Approximate P-Value	1.6138E-05

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean Less Than or Equal to Background Mean (Form 1)
Alternative Hypothesis	Site or AOC Mean Greater Than the Background Mean

Area of Concern Data: IRON(site)

Background Data: IRON(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	78
Number of Distinct Samples	16	71
Minimum	6730	7250
Maximum	62000	63000
Mean	32776	26441
Median	35500	25200
SD	18943	11126
SE of Mean	4736	1260

Site vs Background Two-Sample t-Test

H0: Mu of Site - Mu of Background <= 0

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	92	1.813	1.662	0.037
Satterthwaite (Unequal Variance)	17.2	1.293	1.74	0.107

Pooled SD 12732.389

Conclusion with Alpha = 0.050

* Student t (Pooled) Test: Do Not Reject H0, Conclude Site <= Background
* Satterthwaite Test: Do Not Reject H0, Conclude Site <= Background

Test of Equality of Variances

Numerator DF	Denominator DF	F-Test Value	P-Value
15	77	2.899	0.002

Conclusion with Alpha = 0.05

* Two variances are not equal

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: LEAD(site)

Background Data: LEAD(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	74
Number of Distinct Samples	15	65
Minimum	1.3	2.1
Maximum	366	35.5
Mean	43.23	13.35
Median	11.25	11.25
SD	90.71	6.983
SE of Mean	22.68	0.812

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	748
WMW Test U-Stat	612
WMW Critical Value (0.050)	1076
Approximate P-Value	0.418

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: MAGNESIUM(site)

Background Data: MAGNESIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	70
Number of Non-Detect Data	0	7
Number of Detect Data	16	63
Minimum Non-Detect	N/A	3.8
Maximum Non-Detect	N/A	5
Percent Non detects	0.00%	10.00%
Minimum Detected	1290	139
Maximum Detected	74800	9200
Mean of Detected Data	38266	2102
Median of Detected Data	35000	971
SD of Detected Data	23950	2335

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 5 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1214
WMW Test U-Stat	1078
WMW Critical Value (0.050)	1012
Approximate P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: MANGANESE(site)

Background Data: MANGANESE(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	73
Number of Distinct Samples	16	72
Minimum	83.7	16.7
Maximum	550	1110
Mean	300	362.1
Median	339	305
SD	151.3	273.1
SE of Mean	37.83	31.97

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	687
WMW Test U-Stat	551
WMW Critical Value (0.050)	1060
Approximate P-Value	0.64

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: MERCURY(site)

Background Data: MERCURY(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	78
Number of Non-Detect Data	1	61
Number of Detect Data	15	17
Minimum Non-Detect	0.0048	0.019
Maximum Non-Detect	0.0048	0.06
Percent Non detects	6.25%	78.21%
Minimum Detected	0.0099	0.038
Maximum Detected	0.49	0.27
Mean of Detected Data	0.11	0.127
Median of Detected Data	0.0615	0.12
SD of Detected Data	0.124	0.0561

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.06 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	953
WMW Test U-Stat	817
WMW Critical Value (0.050)	1140
Approximate P-Value	0.0264

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: NICKEL(site)

Background Data: NICKEL(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	76
Number of Non-Detect Data	0	18
Number of Detect Data	16	58
Minimum Non-Detect	N/A	0.21
Maximum Non-Detect	N/A	1.4
Percent Non detects	0.00%	23.68%
Minimum Detected	6.7	4.6
Maximum Detected	46	44.8
Mean of Detected Data	27.15	15.35
Median of Detected Data	31	12.95
SD of Detected Data	12.4	10

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1.4 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1138
WMW Test U-Stat	1002
WMW Critical Value (0.050)	1108
Approximate P-Value	2.5232E-05

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: POTASSIUM(site)

Background Data: POTASSIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	79
Number of Non-Detect Data	0	12
Number of Detect Data	16	67
Minimum Non-Detect	N/A	201
Maximum Non-Detect	N/A	271
Percent Non detects	0.00%	15.19%
Minimum Detected	378	123
Maximum Detected	6900	10900
Mean of Detected Data	3605	1690
Median of Detected Data	4200	694
SD of Detected Data	2227	2232

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 271 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1158
WMW Test U-Stat	1022
WMW Critical Value (0.050)	1156
Approximate P-Value	5.4777E-05

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: THALLIUM(site)

Background Data: THALLIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	12	78
Number of Non-Detect Data	1	64
Number of Detect Data	11	14
Minimum Non-Detect	0.25	0.13
Maximum Non-Detect	0.25	0.45
Percent Non detects	8.33%	82.05%
Minimum Detected	0.19	1.3
Maximum Detected	0.59	3.2
Mean of Detected Data	0.325	2.35
Median of Detected Data	0.34	2.15
SD of Detected Data	0.118	0.656

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.45 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	494
WMW Test U-Stat	416
WMW Critical Value (0.050)	858
Approximate P-Value	0.733

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean Less Than or Equal to Background Mean (Form 1)
Alternative Hypothesis	Site or AOC Mean Greater Than the Background Mean

Area of Concern Data: VANADIUM(site)

Background Data: VANADIUM(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	78
Number of Distinct Samples	16	75
Minimum	11.6	12.2
Maximum	130	101
Mean	59.48	44.97
Median	66	41.4
SD	36.8	18.97
SE of Mean	9.199	2.147

Site vs Background Two-Sample t-Test

H0: Mu of Site - Mu of Background <= 0

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	92	2.315	1.662	0.011
Satterthwaite (Unequal Variance)	16.7	1.536	1.74	0.072

Pooled SD 22.843

Conclusion with Alpha = 0.050

* Student t (Pooled) Test: Reject H0, Conclude Site > Background
* Satterthwaite Test: Do Not Reject H0, Conclude Site <= Background

Test of Equality of Variances

Numerator DF	Denominator DF	F-Test Value	P-Value
15	77	3.764	0

Conclusion with Alpha = 0.05

* Two variances are not equal

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: ZINC(site)

Background Data: ZINC(bkd)

Raw Statistics

	Site	Background
Number of Valid Samples	16	74
Number of Distinct Samples	15	71
Minimum	24.5	4.7
Maximum	152	96
Mean	58.62	35.22
Median	52	29.3
SD	28.54	23.62
SE of Mean	7.135	2.746

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1040
WMW Test U-Stat	903.5
WMW Critical Value (0.050)	1076
Approximate P-Value	0.00051515

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

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APPENDIX D

GEOPHYSICAL INVESTIGATIONS

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APPENDIX D.1

GEOPHYSICAL SERVICES AT SWMU 40/71
GEOPHEX, MAY 2001

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Geophysical Services at SWMU 40/71, Radford Army Arsenal Radford, VA

Geophex Services Job No. 1107

Submitted to:

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May 2001

Introduction

On May 1st-6th, 2001, Geophex Services, Ltd. conducted geophysical surveys at SWMU 40/71 at the Radford Army Arsenal near Radford, VA (Figure 1). The geophysical surveys utilized magnetic, electromagnetic induction, geophysical logging and DC resistivity methods. The objective was to determine the vertical and lateral extent of abandoned landfills present on-site.

Figure 1. View over a portion of SWMU 40/71 survey area, Radford, VA

All data were collected over an area totaling ~ 220,000 sq. feet (~ 5.4 acres). Figure 2 displays a generalized site map of the SWMU 40/71 geophysical survey. All accessible parts of the sites were surveyed on parallel tracklines spaced at intervals of five feet. After analysis of the EM and magnetic data to determine the lateral extent of the landfills, eight DC resistivity profiles were collected at various orientations to highlight the landfill depth and provide information about the underlying bedrock. These data were combined with natural gamma and electromagnetic induction logs collected in wells 40MW2 and 40MW4.

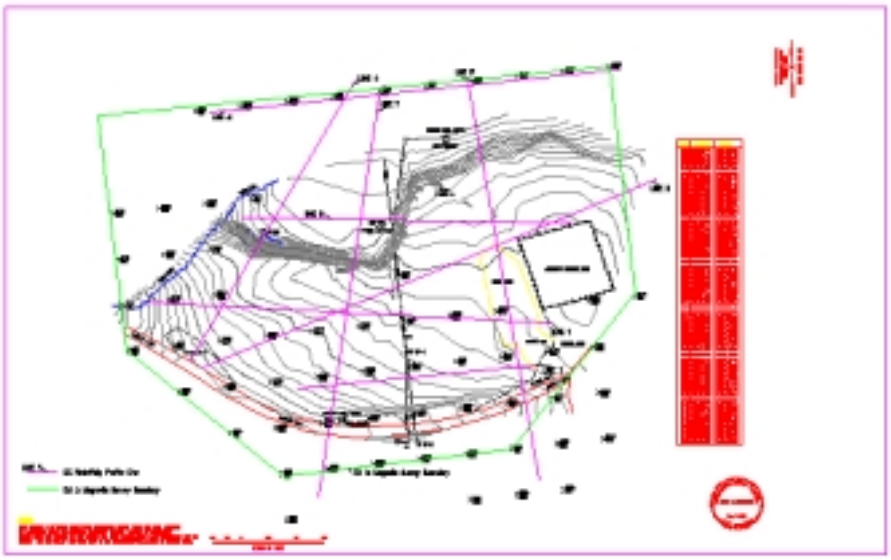


Figure 2. Site map of the geophysical surveys at SWMU 40/71 (see Appendix F for a larger version)

Geophysical Survey Instruments and Acquisition

Geophex acquired electromagnetic data using the GEM-2 sensor (Figure 3). The GEM-2 is an unique, hand-held, digital, broadband EM sensor that was developed at Geophex. The sensor exploits the relationship between electric fields, magnetic fields, and electrical current to detect changes in subsurface conductivity. Electrical conductivity is an inherent property of a material to conduct electrical current and can be used to characterize near-surface geological material efficiently (see Appendix A for additional information). Geophex acquired magnetic data using a cesium-vapor magnetometer, Model G-858 (manufactured by Geometrics) in a vertical gradient configuration (Figure 4). Magnetic surveys identify local deviations in the Earth's magnetic field. These local deviations result from targets that possess high magnetic susceptibilities, such as steel or other iron-bearing materials (see Appendix B for more information). For areas containing numerous metallic objects, the vertical gradient displays improved resolution of multiple targets, and small nearby objects are more accurately detected by reducing survey noise.

Figure 3. GEM-2 electromagnetic induction sensor

Figure 4. G-858 magnetometer in vertical gradient configuration

Following each survey, data were downloaded to a laptop computer in the field for immediate processing. We assigned spatial (i.e., x-y) coordinates to each sensor reading using standard dead-reckoning procedures. We imported the located data into Surfer© (Version 7.0) to produce color contour plots of each data set for inspection. Final locations of the geophysical survey were determined using a differentially corrected global positioning system (DGPS). The DGPS data were obtained using a Trimble survey-grade GPS receiver and post-processed to produce the site map and subsequent data maps. NAD 1983 and Virginia state plane (south) coordinates were used for these displays.

After analysis of the EM and magnetic data to identify the lateral extent of the landfill, a Sting multielectrode DC resistivity system (manufactured SAGA, Inc.) was used to determine the landfill depth (Figure 5). Resistivity can be defined as the observation of electric fields resulting from a current induced into the ground. Resistivity is the property of a material that resists the flow of electrical current (see Appendix C for more information).

The instrument consists of 28 electrodes in a linear array. Electrode spacing varied for the lines according to the azimuth of the profile and available space between cultural features (roads, fences, etc.). Table 1 lists the electrode spacing used for the profiles at SWMU 40/71. All data were acquired using a dipole-dipole configuration.

Table 1. Electrode spacing for resistivity lines acquired at SWMU 40/71.

6 m (19.7 ft.)	5 m (16.4 ft.)	4 m (13.1 ft.)	3 m (9.9 ft.)
Line 3	Line 1 Line 6 Line 7 Line 8	Line 4 Line 5	Line 2

The cable relays were attached to the electrode by use of a rubber band (Figure 6). The surface resistance of each electrode must be less than 2000 Ohms for this technique. To reduce surface resistances, electrodes were treated with salt water prior to data acquisition on each profile.

Figure 5. Sting DC resistivity system

Figure 6. Resistivity electrode during acquisition

The Sting/Swift system required approximately 50 minutes to record resistivity across the entire 28-electrode array. Data were transferred from the Sting earth resistivity meter to a laptop PC in the field. Data were processed by accompanying software that produces 2D resistivity cross-sections.

Geophysical well logs were collected in well 40MW2 (Figure 7) and well 40MW4. The log suite consists of natural gamma and electromagnetic induction (EM) logs for each well. The natural gamma sensor measures the gamma photons that originate from the radioactive decay of naturally occurring isotopes of Potassium-40 and daughter products of Uranium-238 and Thorium-232. Natural Gamma logs are commonly used to determine the clay content of the formation surrounding the borehole. An increase in gamma counts per second typically indicates a higher percentage of clay. EM logs reflect the amount of increased pore fluid/clay present within the section. A greater amount of pore fluid or clay will show an increased conductivity. Both wells consisted of 4 in. diameter PVC casing and were dry throughout the entire depth (56 ft. for 40MW2 and 62 ft. for 40 MW4). EM logs are displayed as conductivity (mS/m) and resistivity (ohm-m), while the natural gamma logs are displayed in counts per second (CPS).

Figure 7. Well 40MW2 at SWMU 40/71

Instrument calibration and QA/QC

QA/QC and calibration of geophysical instrumentation used at SWMU 40/71 were accomplished by a combination of pre-site calibration, on-site calibration, and on-site repeatability checks. Table 2 is a list of instruments and the QA/QC and calibration implemented. All QA/QC figures are displayed in Appendix D. All instruments performed well during the SWMU 40/71 surveys.

Table 2. Calibration and QA/QC for geophysical instruments at SWMU 40/71

Instrument/Tool	Calibration	QA/QC Technique
Surface EM (GEM-2)	Pre-site-ferrite rod calibration	Trackline repeat
Surface Magnetics (G-858)	NA	Trackline repeat
Surface Resistivity (Sting)	On-site resistance—19.92 ohm	Profile repeat –Line 2
Borehole Gamma (Mt. Sopris)	On-site calibration jig	Repeat run in both wells

Borehole EM (Geonics)	Pre-site and free-air on-site	Repeat run in both wells

Data Results

Logging results are displayed in Figure 8 for well 40MW2. The gamma log displays three bulk zones (0'-28', 28'-49', and > 49'). Drilling logs indicate the upper zone is silt and silty-clay associated with the local soils. The second zone is described as the bedrock dolomite. According to drilling logs, the dolomite contains "soft" and "hard" zones and lenses of clay/silt and limestone. The logs indicate the zone of most competent dolomite from 40' to 45'. The third zone identifies a rock unit described as clays and silts. Increased conductivity is measured at each of these major transitions. Since this well was dry and predominantly dolomite, the conductivity is an indirect indication of the formation porosity at any given depth. In turn, the formation porosity may infer zones where lithologic properties change (e.g. a clay lens within the dolomite at 25', "soft" dolomite vs. "hard" dolomite transition at 37', etc.).

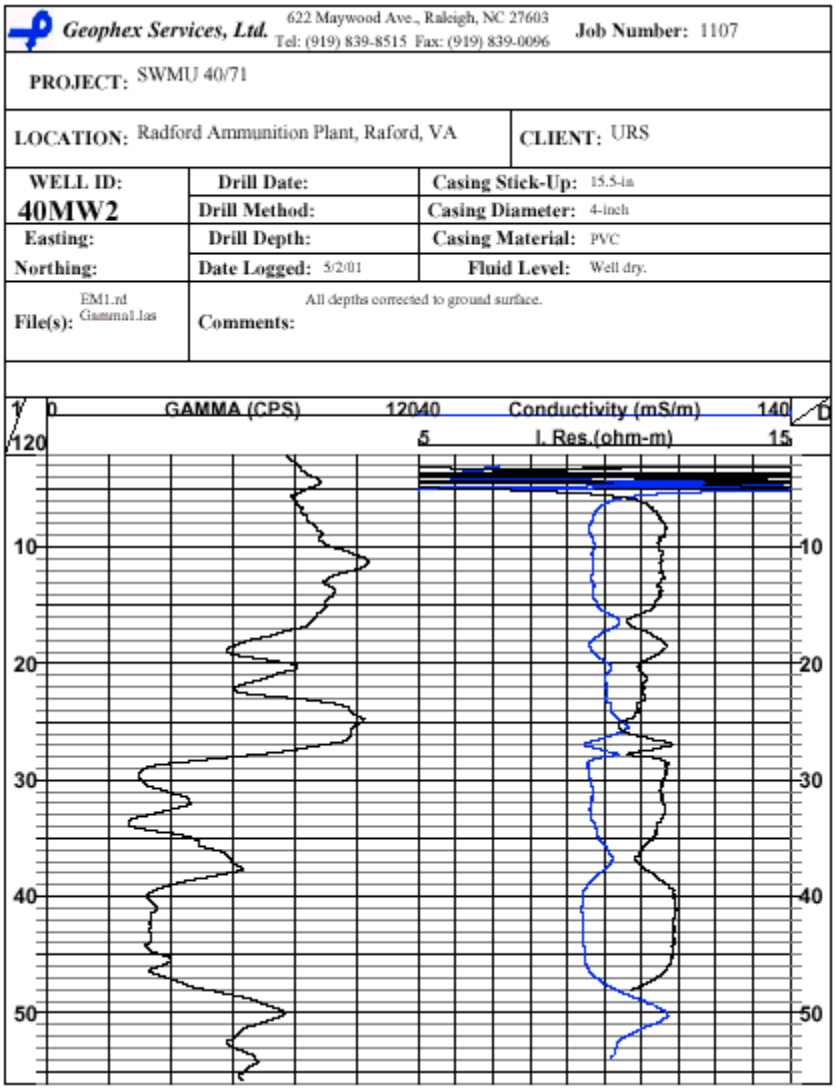


Figure 8. Well logs for well 40MW2

The 40MW4 gamma log displays two bulk zones (0'-30', and > 30') in Figure 9. Drilling logs list the upper zone to be silt and silty-clay associated with the local soils. The lower zone is described as bedrock dolomite. The dolomite contains zones referred to as "soft" or "hard". Additionally, limestone seams were noted within this unit. The largest gamma fluctuation at 34' depth is described as a clay zone, or well-cemented thin limestone (high clay content) seams. Gamma fluctuations from 40'-60' are inferred to represent additional seams of clay, or limestone within the bulk dolomite.

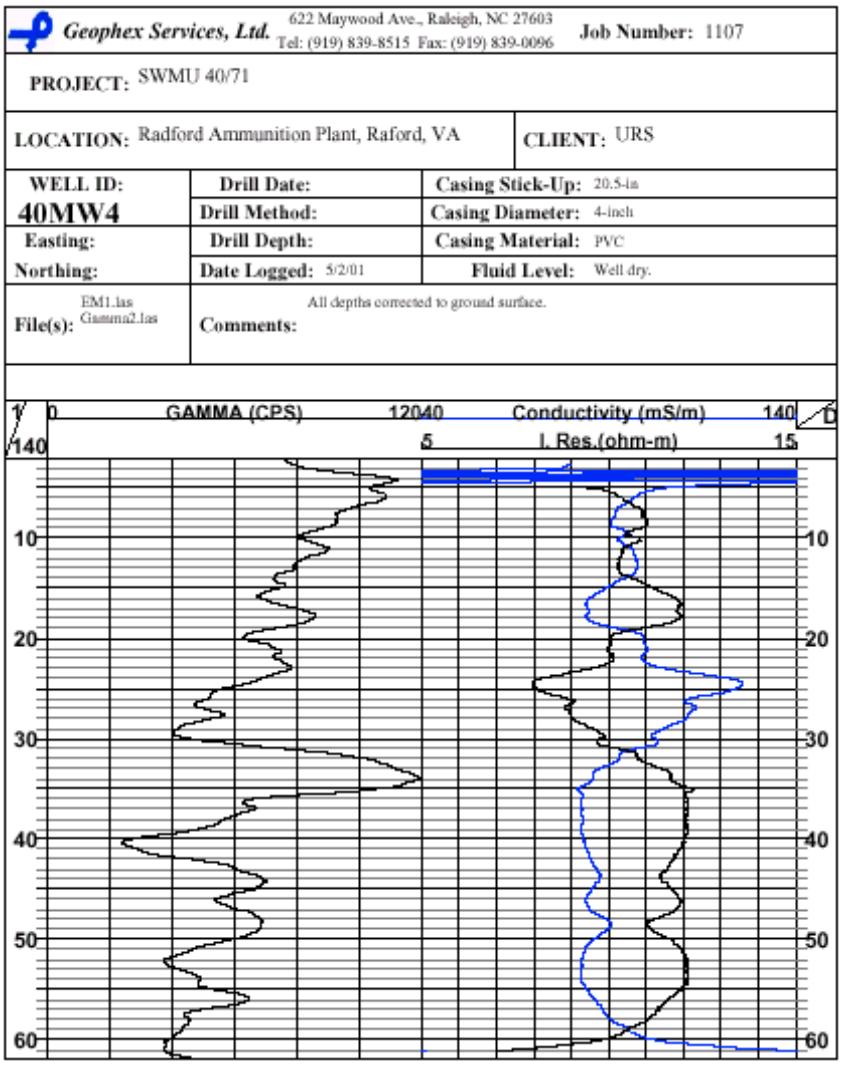


Figure 9. Well logs for well 40MW4

Electromagnetic and magnetic results are displayed in Figures 10 and 11 for the site. Inphase EM results are shown for a frequency of 1,050 Hertz. These results reveal the outline of the waste/burial area, which consists of a large concentration of buried metallic objects. The outline of the waste area is indicated on the figures and the one large negative anomaly (blue in color) in the north half of the interpreted waste area is indicative of a large concentration of ferrous material. The smaller negative anomaly in the south half of the interpretative waste area also is indicative of an accumulation of buried ferrous material. It is not possible with these data to distinguish the identity of these objects beyond the fact that they are metallic. The vertical magnetic gradient data also indicates large concentrations of ferrous metals on this site (Figure 11). The isolated anomalies (especially in the "Backfill" area in the toe of the hill-slope) having a dipole signature (a negative peak (blue in color) and a positive peak (red in color)) represent rusted scrap metal similar to that seen in Figure 12.

Figure 12. Photo of surface scrap metal at SWMU 40/71

Apparent conductivity calculated from the 4,170 Hz EM data is shown in Figure 13. These data outline both the waste and backfill areas. High apparent conductivity defines the waste area (yellow-red colors). As with the 1,050 inphase data, the data appear to highlight two trench-like features. Both of these contain the highest apparent conductivities in the dataset.

Resistivity profiles show the SWMU 40/71 waste area to be less resistive than the surrounding bedrock. Figures 14 and 15 display Lines 7 and 8, respectively. All resistivity profiles are displayed in a larger format in Appendix E. These lines are perpendicular to the major axis of the waste area (refer to Figure 2 or Appendix F for resistivity line locations). Line 7 highlights a maximum burial depth of approximately 65 feet. Line 8 shows a slightly different burial geometry. Maximum depth of the waste area in line 8 is approximately 50 feet. Also, Line 8 crosses the backfilled area (i.e. soil and rock fill area). Although not as conductive as the waste area, this material is still more electrically conductive than the underlying bedrock. Waste and burial area depths are indicated on the profiles in Appendix E.

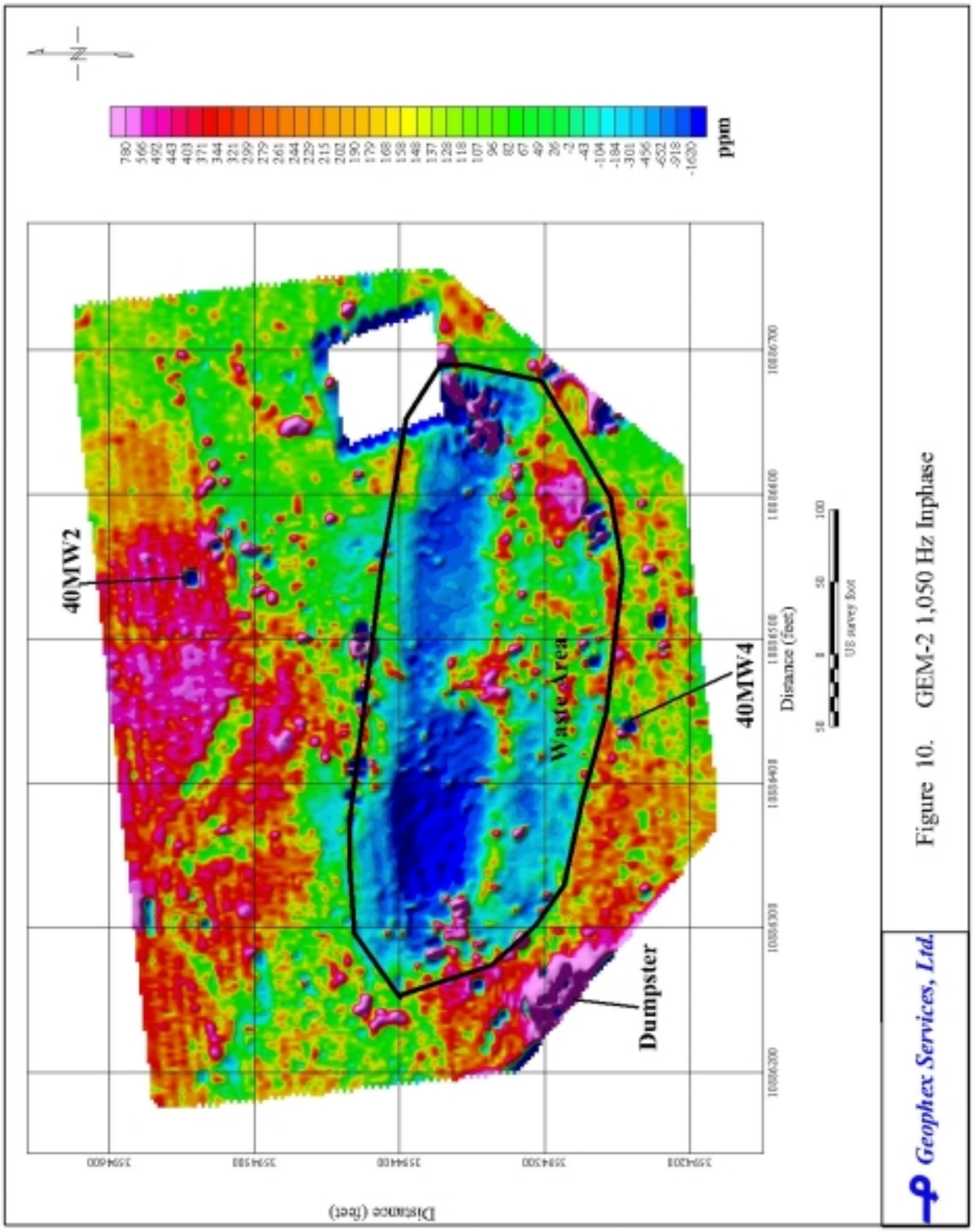


Figure 10. GEM-2 1,050 Hz Inphase

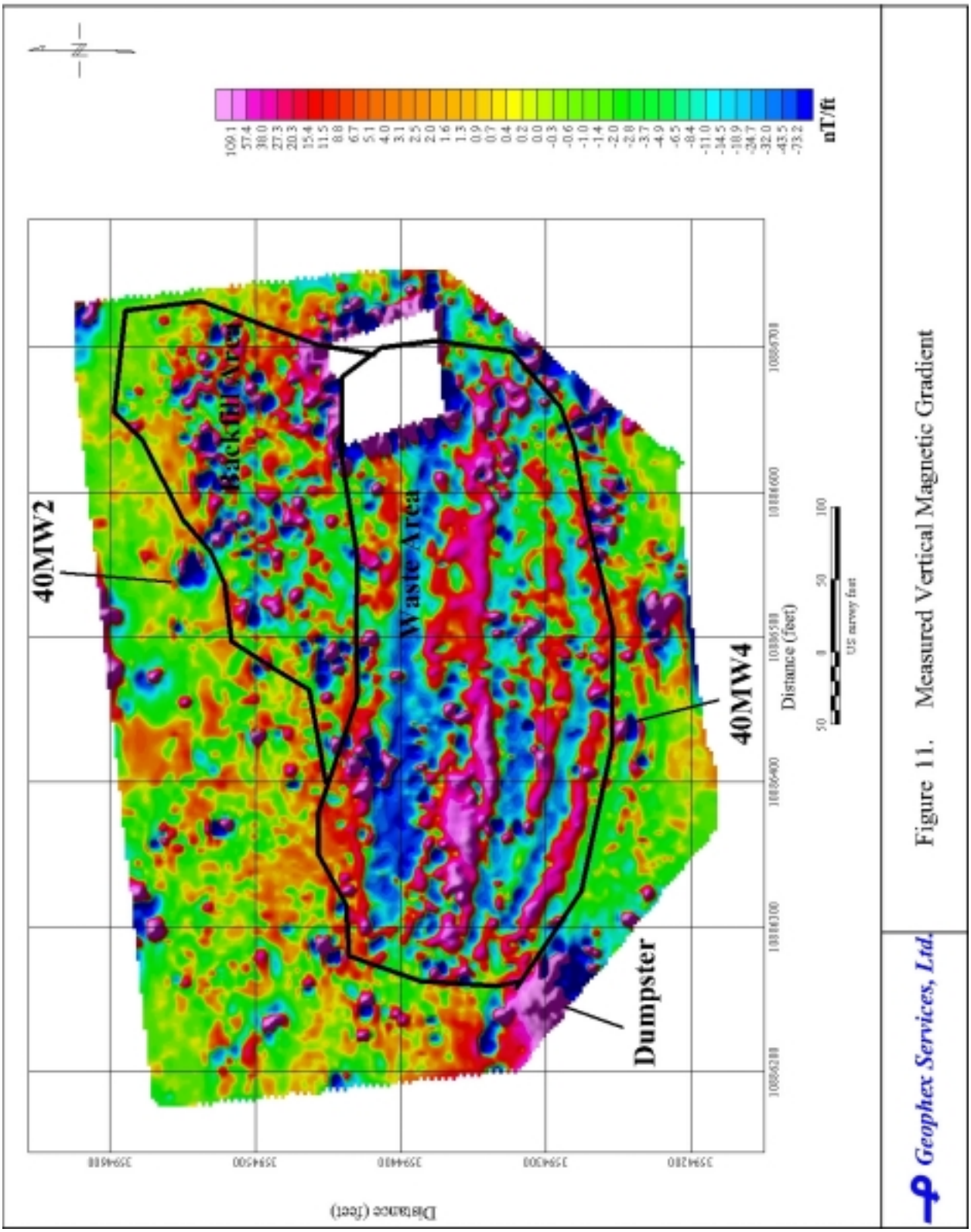


Figure 11. Measured Vertical Magnetic Gradient

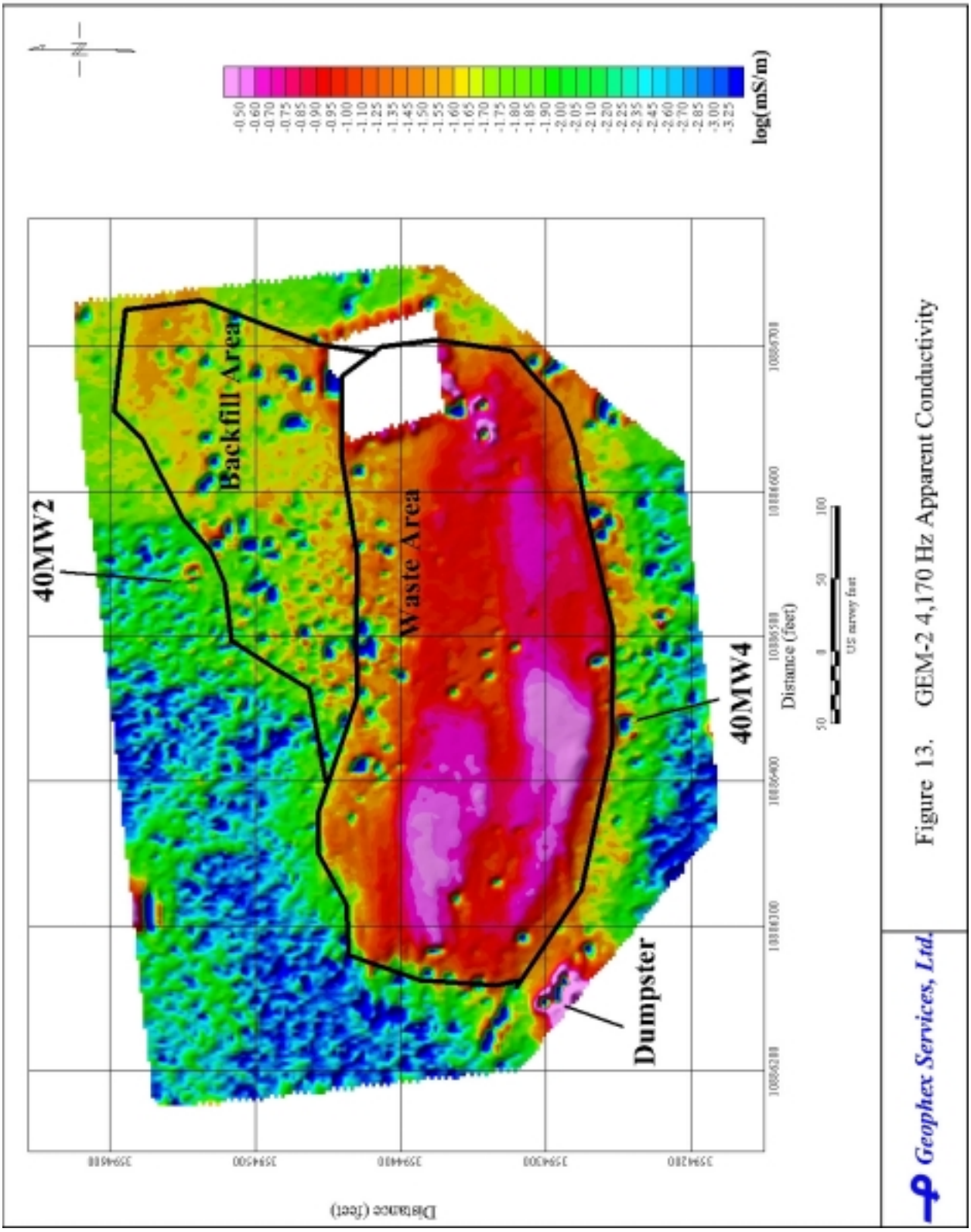


Figure 13. GEM-2 4,170 Hz Apparent Conductivity

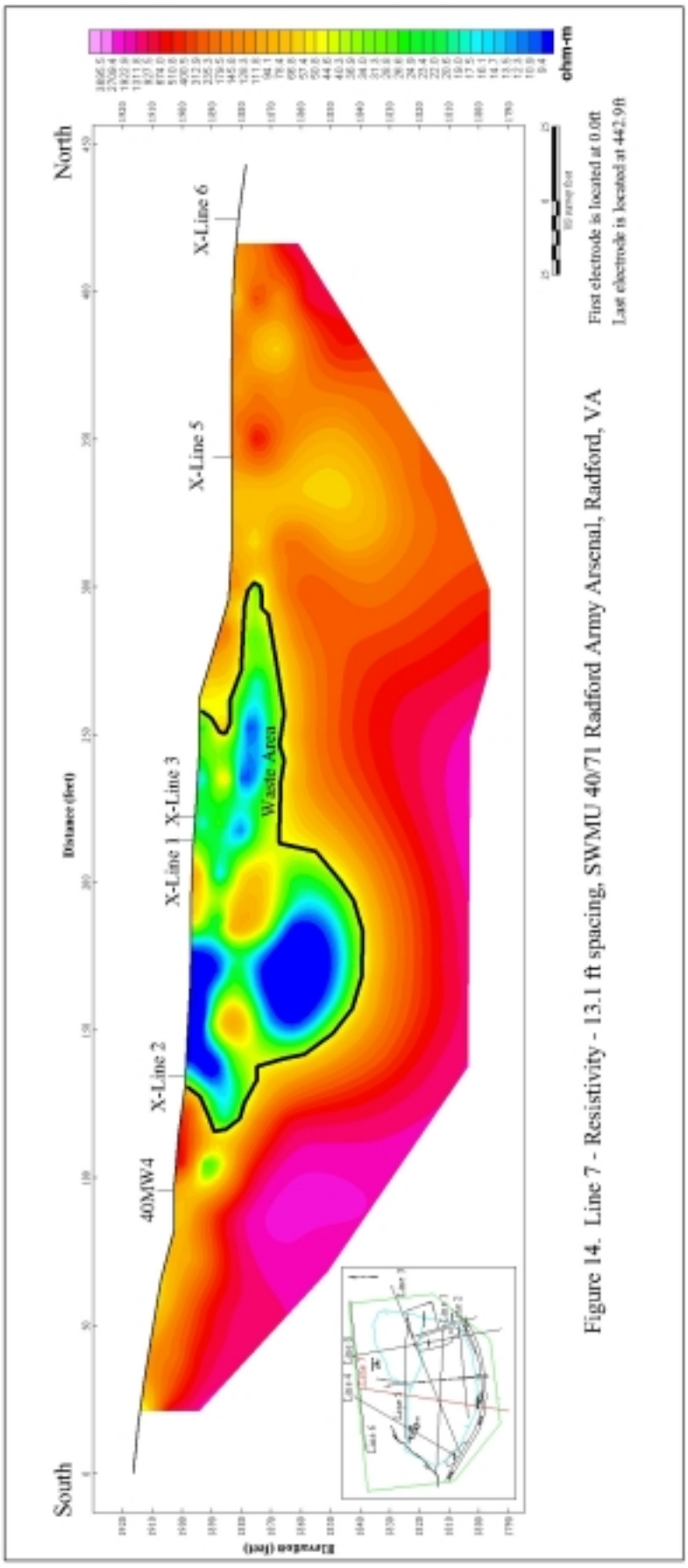


Figure 14. Line 7 - Resistivity - 13.1 ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

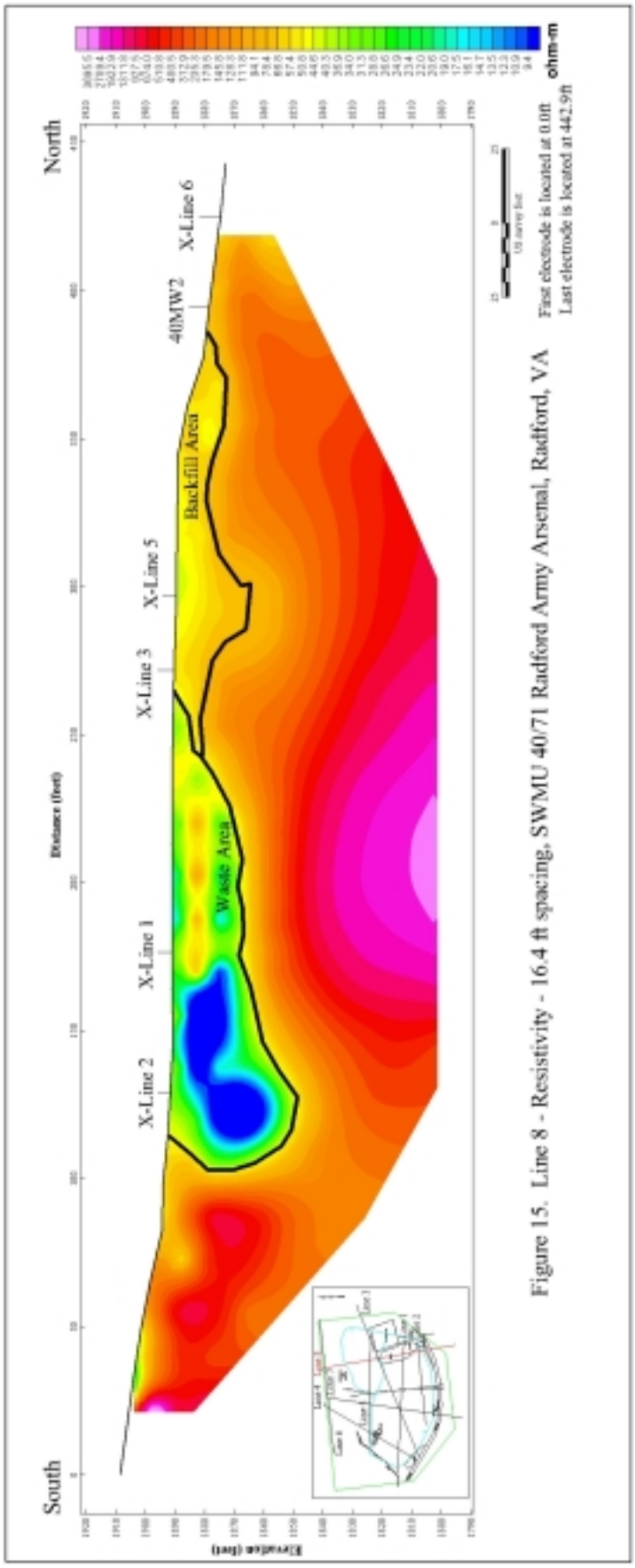


Figure 15. Line 8 - Resistivity - 16.4 ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

The bedrock surface is irregular and contains areas of lower resistivity. On Figure 14 near 40MW4, this lower resistivity correlates to the "soft" dolomite described during drilling. At that same location a bit deeper, the resistivity profile increases and may be correlated to the "hard" dolomite mapped in 40MW4. Line 6 (Appendix E) was run completely off the waste and backfill areas and displays a zone of lowered resistivity in the center of the profile approximately 40 feet below the surface. It was anticipated that karst might be present in this area. Typically, karst would appear as a very conductive anomaly if water/loose sediment filled or a very resistive anomaly if air filled. No profile from this area shows any anomaly that would undeniably indicate an air filled karst at depth. It may be that void formation is occurring at depth within those areas of lowered resistivity and is not distinguishable from the "soft" dolomite areas encountered during drilling (refer to Appendix E Line 1 near 150', Line 3 near 250', Line 4 near 275'& 300' (near surface), Line 5 near 135' (near surface), Line 6 near 50' / 200' / 260' & 370', Line 7 near 340' & 390' (near surface)).

In summary, Figure 16 is an interpretational map of the depth to the bottom of SWMU 40/71. Depths are listed in black next to the various resistivity profiles. Depths listed in parenthesis indicate that the bottom of the landfill was not imaged by the resistivity data and lies below that depth. A larger scale version of this map can be found in Appendix F.

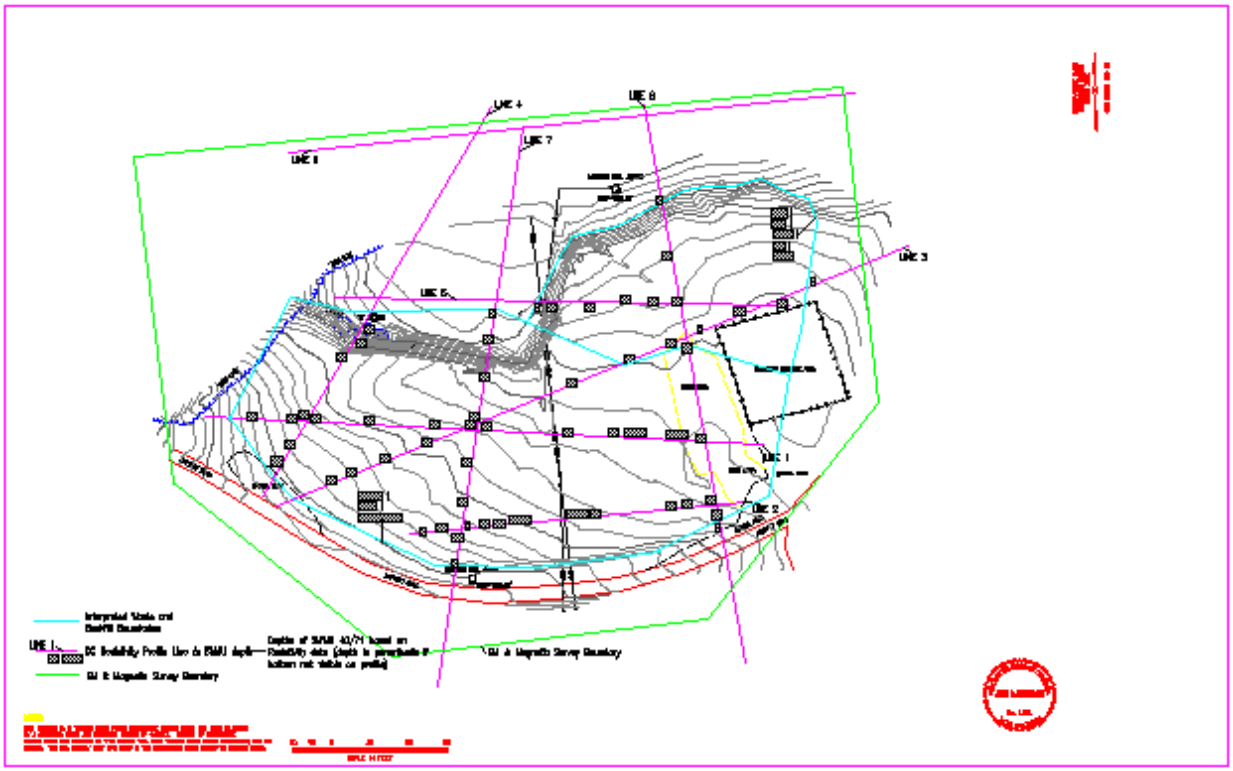


Figure 16. Interpretational map for SWMU 40/71 waste and backfill depths.

Appendix A
Electromagnetic Method

The electromagnetic (EM) induction method, which is founded upon Maxwell's Equations (the relationship between electric fields, magnetic fields and electric current), characterizes the electrical conductivity of the subsurface and can be used to characterize shallow geological conditions. Electrical conductivity is an inherent property of a material to conduct electrical current. Variations in shallow earth conductivity can result from changes in soil moisture content, groundwater constituents (contamination), and lithological properties, as well as buried man-made materials. The primary application of EM surveys in site assessments are for:

- Searching for waste pits and trenches,
- Determining boundaries of landfills and other burial sites,
- Delineating leachate plumes,
- Locating buried drums, USTs, and other isolated metallic objects, and
- Detecting buried unexploded ordnance (UXO).

The EM method involves exciting the ground material with a primary, time-varying, electromagnetic field of one or more frequencies, and recording perturbations of the normal field that result from secondary eddy currents induced in conducting bodies at or beneath the surface. The primary field is typically established, in practice, by passing an alternating current through a small coil (i.e., the transmitter coils). The intensity of the induced eddy currents in the subsurface is a function of the ground conductivity and is measured by the receiver coil. The receiver generally consists of one or more coils, suitably arranged and connected to a data logger. Field efficient EM instruments, such as the Geophex Electromagnetic (GEM) sensor (Figure A-1; Won et al., 1996), combine the transmitter, receiver, and processing electronics (data logger) into a single, lightweight, man-portable instrument.

Figure A-1. Photograph of the Geophex Electromagnetic (GEM-2) instrument during a site characterization study

The primary advantage of electromagnetic induction sensors for detection of shallow man-made targets is that these sensors are sensitive to either ferrous or nonferrous (e.g., aluminum, copper, iron, steel) metals. The electromagnetic induction sensor can be used in conjunction with magnetic surveys for enhanced detection.

Figure A-2, adapted from Won (1980), shows ranges of conductivity for typical earth materials and the relationship between transmitter frequency and the skin depth (i.e., the maximum depth of exploration). In general, sediments and sedimentary rocks have higher conductivity than igneous or metamorphic rocks. Clay, owing to its electrolytic interaction with water, exhibits high conductivity, while typical sand shows relatively low conductivity.

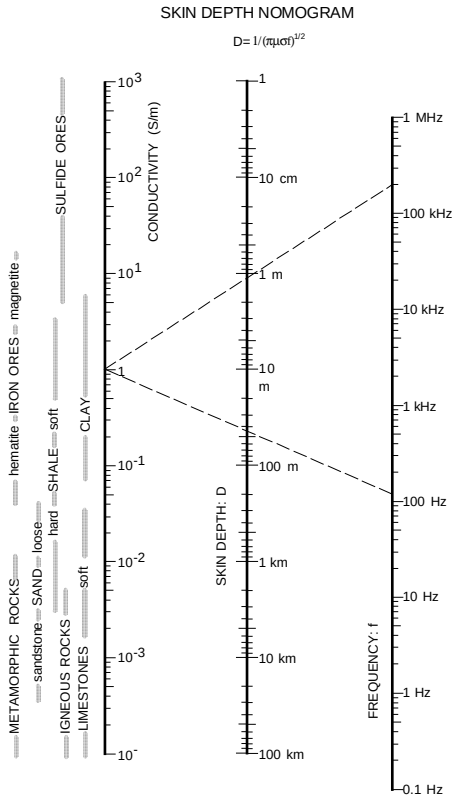


Figure A-2. Nomogram showing the relationship between transmitter frequency, ground conductivity, and depth of penetration. Magnetic permeability, μ, is assumed to be that of the free space. (From Won, 1980. Courtesy: Society of Exploration Geophysicists.)

The electromagnetic induction method can be used to target different depths of interest. The effective depth of exploration can be varied by changing either: 1) the spacing between transmitter and receiver coils, or 2) the frequency of the transmitted field (Patra and Mallick, 1980). The first method is known as *geometrical sounding* and involves recording data using several transmitter-receiver coil spacings at a fixed location; the depth of exploration increases with the coil spacing. The two coils systems (e.g., EM-24 by Geonics), although typically connected by an umbilical cord, are physically separate and thus require two field operators.

The second method is known as *frequency sounding* and involves changing the transmitter frequency, but keeping the transmitter-receiver coil constant (Figure A-3). The depth of exploration is inversely proportional to the square root of the frequency: a low frequency signal travels far through a conductive earth and, thus, sees deep structures, while a high frequency signal can travel only a short distance and, thus, sees only shallow structures. Therefore, broadband parametric sounding is analogous to depth sounding and can be used to create a pseudo 3-D subsurface image (Won, 1983).

Frequency sounding possesses inherent advantages over geometric sounding for depth imaging because: 1) signal attenuation does not allow a signal of fixed frequency to penetrate much deeper than several skin depths, and 2) geometrical sounding averages laterally and thus decreases the resolution. Theoretical and practical discussions on these methods may be found in Grant and West (1965), Keller and Frischkneckt (1966), Kaufman and Keller (1983), and Nabighian (1988).

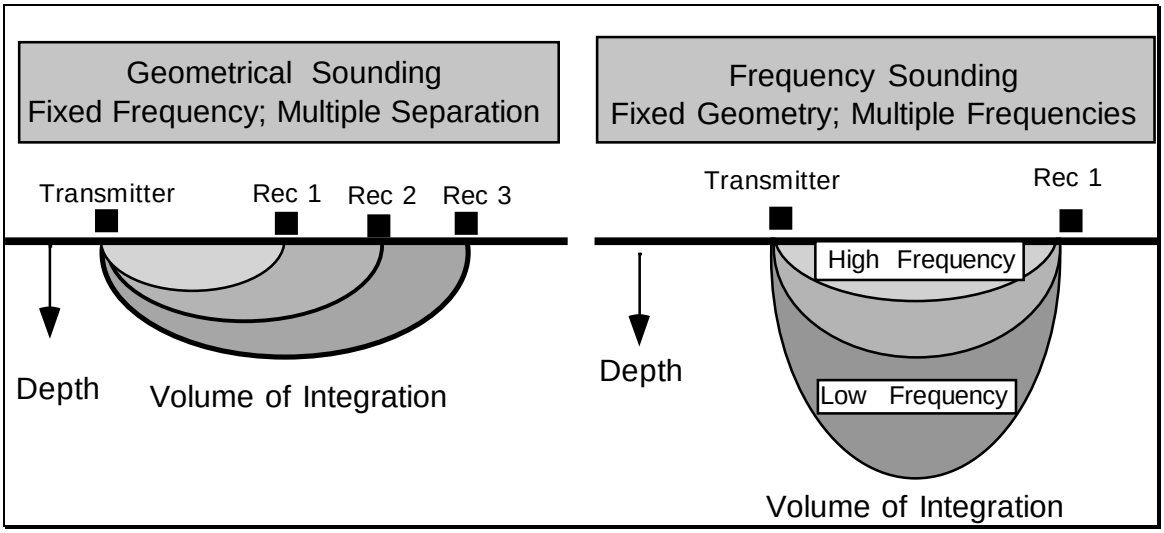


Figure A-3. Electromagnetic methods for depth sounding.

References

Grant, F. S., and West, G. F., 1965, *Interpretation Theory in Applied Geophysics*, McGraw-Hill, New York, 584 p.

Kaufman, A. A., and Keller, G. V., 1983, *Frequency and Transient Soundings*, Elsevier Publishing, Amsterdam, 685 p.

Keller, G. V., and Frischkneckt, F. C., 1966, *Electrical Methods in Geophysical Prospecting*, Pergamon Press, New York, 571 p.

Patra, H. P., and Mallick, K., 1980, *Geosounding Principles 2*, Elsevier Scientific Publishing Company, New York, 419 p.

Won, I. J., 1983, A sweep-frequency electromagnetic exploration method, Chapter 2, in *Development of Geophysical Exploration Methods-4*, Editor; A. A. Fitch, Elsevier Applied Science Publishers, Ltd., London, p. 39-64.

Won, I. J., Keiswetter, D., Fields, G., and Sutton, L., 1996, GEM-2: A new multifrequency electromagnetic sensor, Journal of Environmental and Engineering Geophysics, v. 1, n. 2, p. 129-137.

Appendix B
Magnetic Method

Magnetic methods provide a fast, efficient, and cost-effective technique to identify and characterize local high magnetic susceptibility targets that produce deviations in the Earth's magnetic field. Magnetic susceptibility is a basic material property and represents the degree of magnetization of a material placed in an external magnetic field. Magnetic susceptibility of a geologic material is proportional to its content of iron-bearing minerals, principally magnetite, the most abundant magnetic mineral in the Earth. The principal applications of magnetic surveys in site assessments are for:

- Locating buried drums, USTs, and pipes;
- Delineating pits and trenches containing ferrous materials;
- Delineating boundaries of landfills with ferromagnetic debris; and
- Mapping subsurface geology.

The signals measured in a magnetic survey are influenced by the ambient magnetic field of the Earth. The Earth's magnetic field resembles that of a single dipole whose axis deviates about 10 degrees from geographic north. The strength of the Earth's magnetic field is about 60,000 gammas near the north pole where it is directed vertically into the Earth, and about 30,000 gammas near the equator where it is parallel to the Earth's surface.

Buried steel objects cause local perturbations in the Earth's magnetic field (Figure B-1). The Earth's magnetic field magnetizes ferrous material (either man-made or natural) in parallel with and proportional to the local Earth's magnetic field. Therefore, the intensity and shape of perturbations caused by a buried drum, for example, is a function of latitude (Figure B-2). The total magnetic field measured is the vector sum of the ambient Earth's magnetic field and the local perturbation.

Two types of magnetic surveys are commonly conducted: 1) measurement of the total field, or 2) measurement of the vertical gradient. Although the field procedures are very similar for the two surveys, the measured data and interpretation methods can sometimes be quite different. The vertical gradient, measured by recording the magnetic field at two, vertically separated sensors and calculating the difference, is to detect and locate small and shallow-buried objects, such as drums. Because vertical gradient anomalies decay inversely proportional to distance from the object raised to the fourth power, as opposed to the third power for the total field anomaly, vertical gradient anomalies are more sharply defined in the immediate area of the ferrous object. In contrast, the total field anomaly of a small shallow ferrous object will be broad, and hence, possibly unidentified during an actual survey. Commercially available magnetic instruments (e.g., the G-858 Magnetometer from Geometrics) allow the simultaneous recording of the total field and the vertical gradient.

An example of a magnetic gradient survey, conducted to locate burial trenches that contain hazardous waste and miscellaneous debris, is shown in Figure B-3.

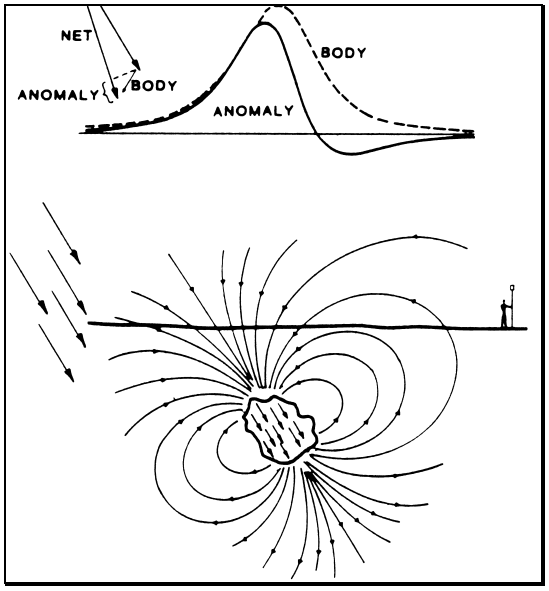


Figure B-1. The Earth's magnetic field induces a magnetic moment in buried ferromagnetic materials (bottom). This induced field, in turn, causes local perturbations (anomaly) in the measured total magnetic field (top).

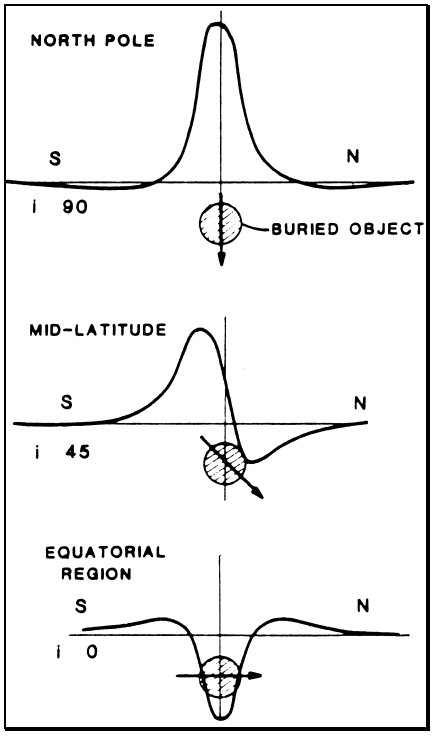


Figure B-2. Schematic illustration of the shape of magnetic anomalies (local perturbations) as a function of latitude.

Appendix C
Resistivity Method

The purpose of electrical surveys is to determine the subsurface resistivity distribution by making measurements on the ground surface. From these measurements, the true resistivity of the subsurface can be estimated. The ground resistivity is related to various geological parameters such as the mineral and fluid content, porosity and degree of water saturation in the rock. Electrical resistivity surveys have been used for many decades in hydrogeological, mining and geotechnical investigations. More recently, it has been used for environmental surveys. 2-D resistivity imaging surveys have been carried out for many purposes such as detecting leakage of pollutants from landfill sites, areas with undulating limestone bedrock, mapping of the over burden thickness , leakage of water from dams, and the saline water intrusion in coastal aquifer. The resistivity imaging method has also been used in underwater surveys in lakes and dams.

Resistivity values are measured by injecting a current into the ground via two electrodes and measuring the resulting voltage difference at two separate potential electrodes. From the current (I) and voltage (V) values, an apparent resistivity (p_a) value is calculated.

p_a = k V / I

The calculated resistivity value is not the true resistivity of the subsurface, but an ”apparent” value that is the resistivity of a homogeneous ground that will give the same resistance value for the same electrode arrangement. The relationship between the “apparent” resistivity and the “true” resistivity is a complex relationship. To determine the true subsurface resistivity, an inversion of the measured apparent resistivity values using a computer program must be carried out.

Resistivity surveys give a picture of the subsurface resistivity distribution. To convert the resistivity values into a geological picture, Table 1 shows the resistivity values of common rocks, soil materials and chemicals (Keller and Frischknect 1966, Daniels and Alberty 1966). Igneous and metamorphic rocks typically have high resistivity values. Sedimentary rocks, which usually are more porous and have a larger water content, normally have lower resistivity values. Wet soils and fresh ground water have even lower resistivity values. The resistivity of these rocks is greatly dependent on the degree of fracturing, and the percentage of fractures filled with ground water. Resistivity values have a much larger range compared to other physical quantities mapped by other geophysical methods. The resistivity of rocks and soils in a survey area can vary by several orders of magnitude.

Table 1. Resistivities of some common rocks, minerals and chemicals.

Material	Resistivity (Ω•m)	Conductivity (Siemen/m)
Igneous and Metamorphic Rocks		
Granite	$5x10^{3}$ - 10^{6}	10^{-6} - $2x10^{-4}$
Basalt	10^{3} - 10^{6}	10^{-6} - 10^{-3}
Slate	$6x10^{2}$ - $4x10^{7}$	$2.5x10^{-8}$ - $1.7x10^{-3}$
Marble	10^{2} - $2.5x10^{8}$	$4x10^{-9}$ - 10^{-2}
Quartzite	10^{2} - $2x10^{8}$	$5x10^{-9}$ - 10^{-2}
Sedimentary Rocks		
Sandstone	8 - $4x10^{3}$	$2.5x10^{-4}$ - 0.125
Shale	20 - $2x10^{3}$	$5x10^{-4}$ - 0.05
Limestone	50 - $4x10^{2}$	$2.5x10^{-3}$ - 0.02
Soils and waters		
Clay	1 - 100	0.01 - 1
Alluvium	10 - 800	$1.25 x10^{-3}$ - 0.1
Groundwater (fresh)	10 - 100	0.01 - 0.1
Sea water	0.2	5
Chemicals		
Iron	$9.074x10^{-8}$	$1.102x10^{7}$
0.01 M Potassium chloride	0.708	1.413
0.01 M Sodium chloride	0.843	1.185
0.01 M acetic acid	6.13	0.163
Xylene	$6.998x10^{16}$	$1.429x10^{-17}$

To acquire these data, a DC resistivity acquisition systems, such as the STING (Advanced Geoscienes, Inc.) must be connected to electrodes that are inserted into the ground. To reduce surface resistances, electrodes are treated with salt water prior to data acquisition on each profile.

These systems required approximately one hour to record resistivity values across an entire 28-electrode array. Data are transferred from the resistivity meter to a laptop PC and immediately inverted to produce 2D resistivity cross-sections.

Selected References:

Barker, R. and Moore, J., 1998. The application of time-lapse electrical tomography in groundwater studies. The Leading Edge, 17, 1454-1458.

Bernstone, C. and Dahlin, T., 1999. Assessment of two automated electrical resistivity data acquisition systems for landfill location surveys: Two case histories. Journal of Environmental and Engineering Geophysics, 4, 113-122.

Dahlin, T. 1996. 2-D resistivity surveying for environmental and engineering applications. First Break, 14, 275-284.

Keller, G. V. and Frischknecht, F.C., 1966. Electrical methods in geophysical prospecting, Pergamon Press Inc., Oxford.

Appendix D
Calibration and QA/QC plots

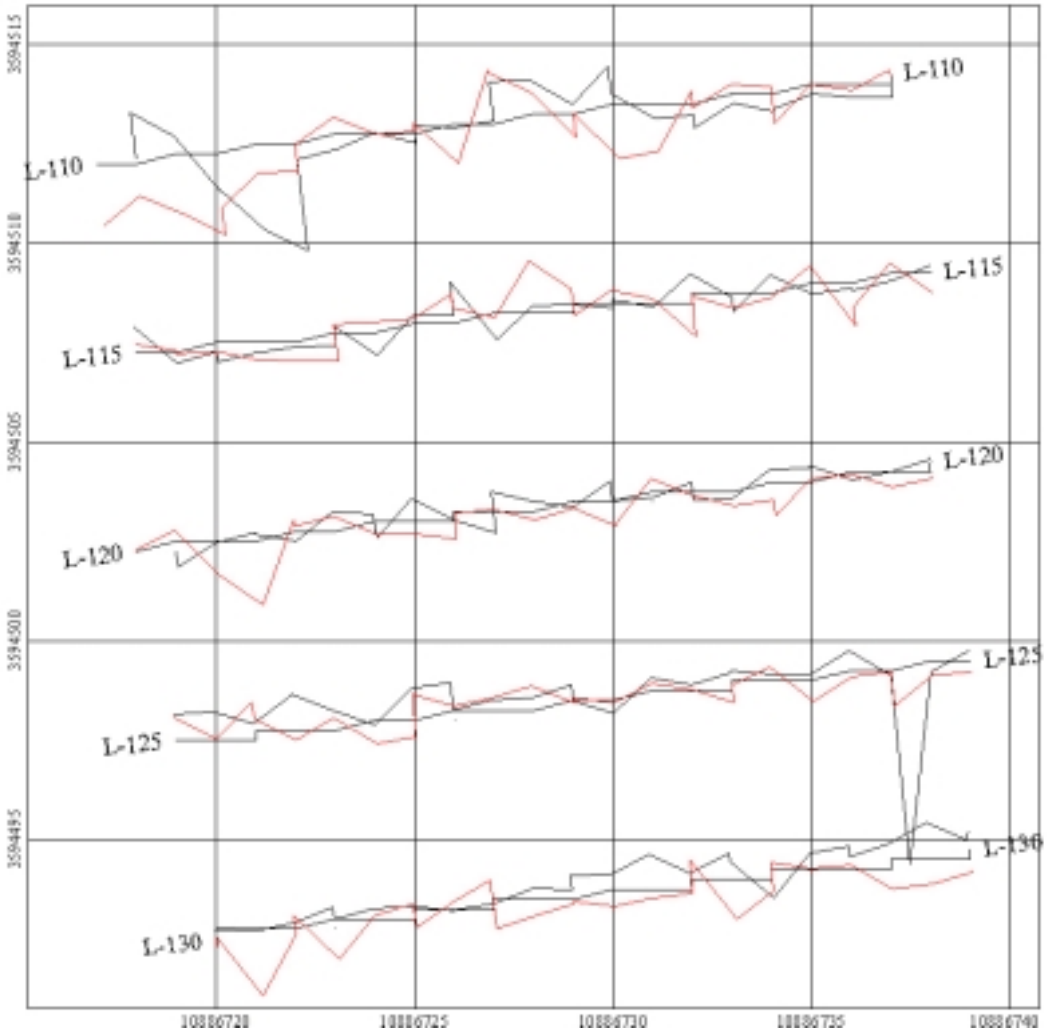


Figure D-1. Repeat tracklines for the surface EM data collected with the GEM-2. These lines were north of the asbestos storage area. Since they were run on different days the values are not exactly the same. However, the trends are similar and the differences seen are within the noise levels of the equipment.

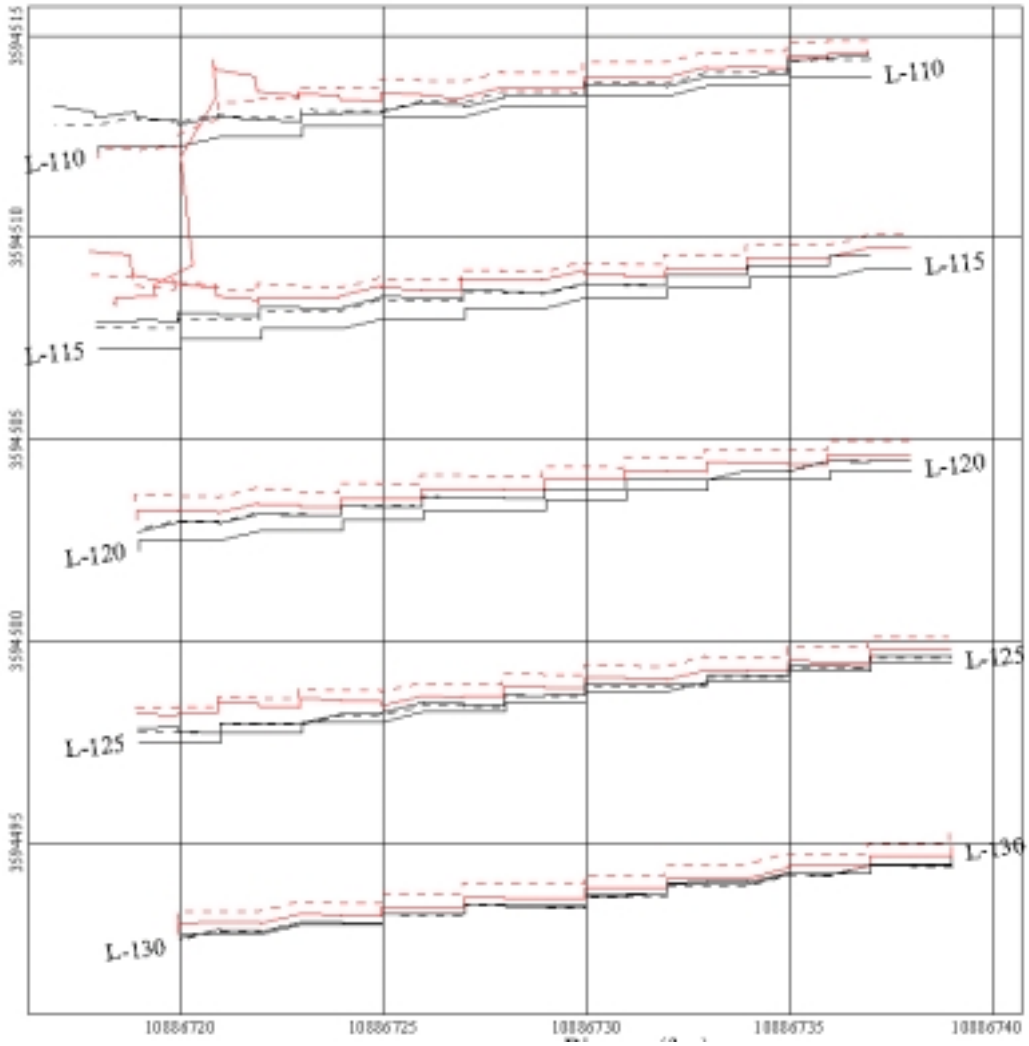


Figure D-2. Repeat tracklines for the surface Magnetic data collected with the G-858 Vertical Gradient Magnetometer. These lines were north of the asbestos storage area. Since they were run on different days the values are not exactly the same. The dashed lines display the upper magnetic sensor and the solid lines display the lower magnetic sensor for the survey (black lines) and repeated (red) data. The difference at the beginning of the first line was attributed to the sensors deviating from vertical during data collection.

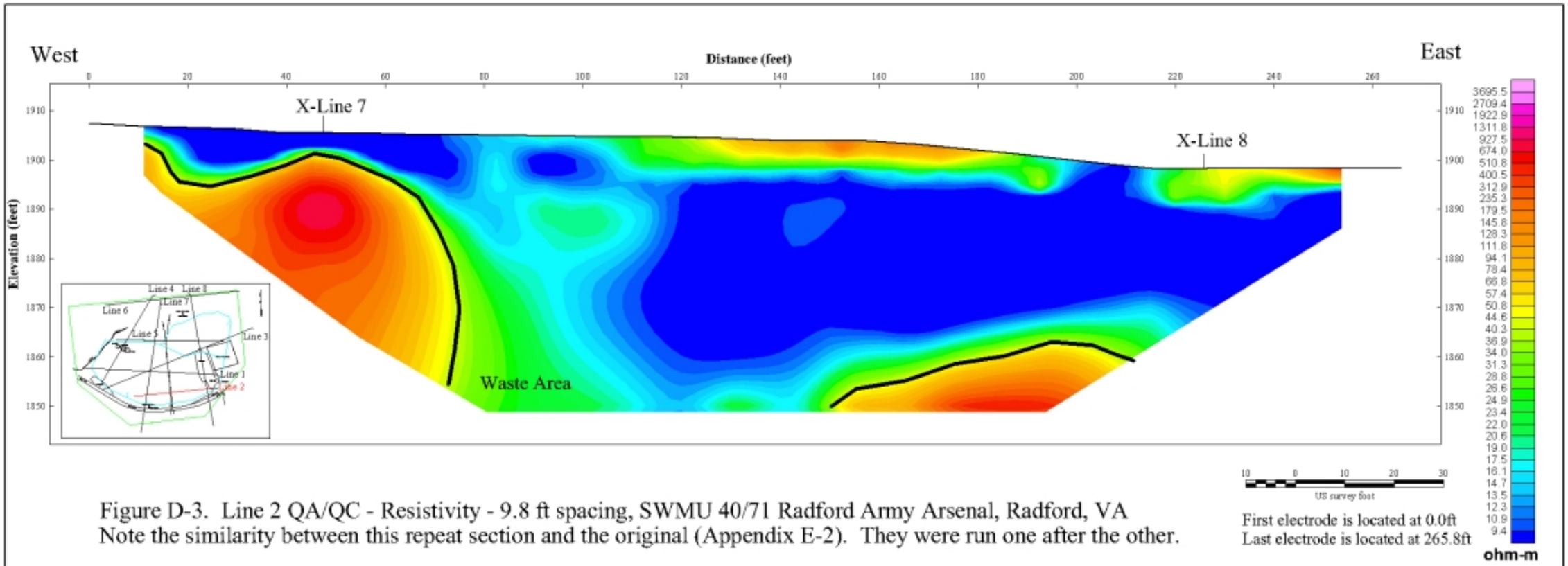


Figure D-3. Line 2 QA/QC - Resistivity - 9.8 ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA
Note the similarity between this repeat section and the original (Appendix E-2). They were run one after the other.

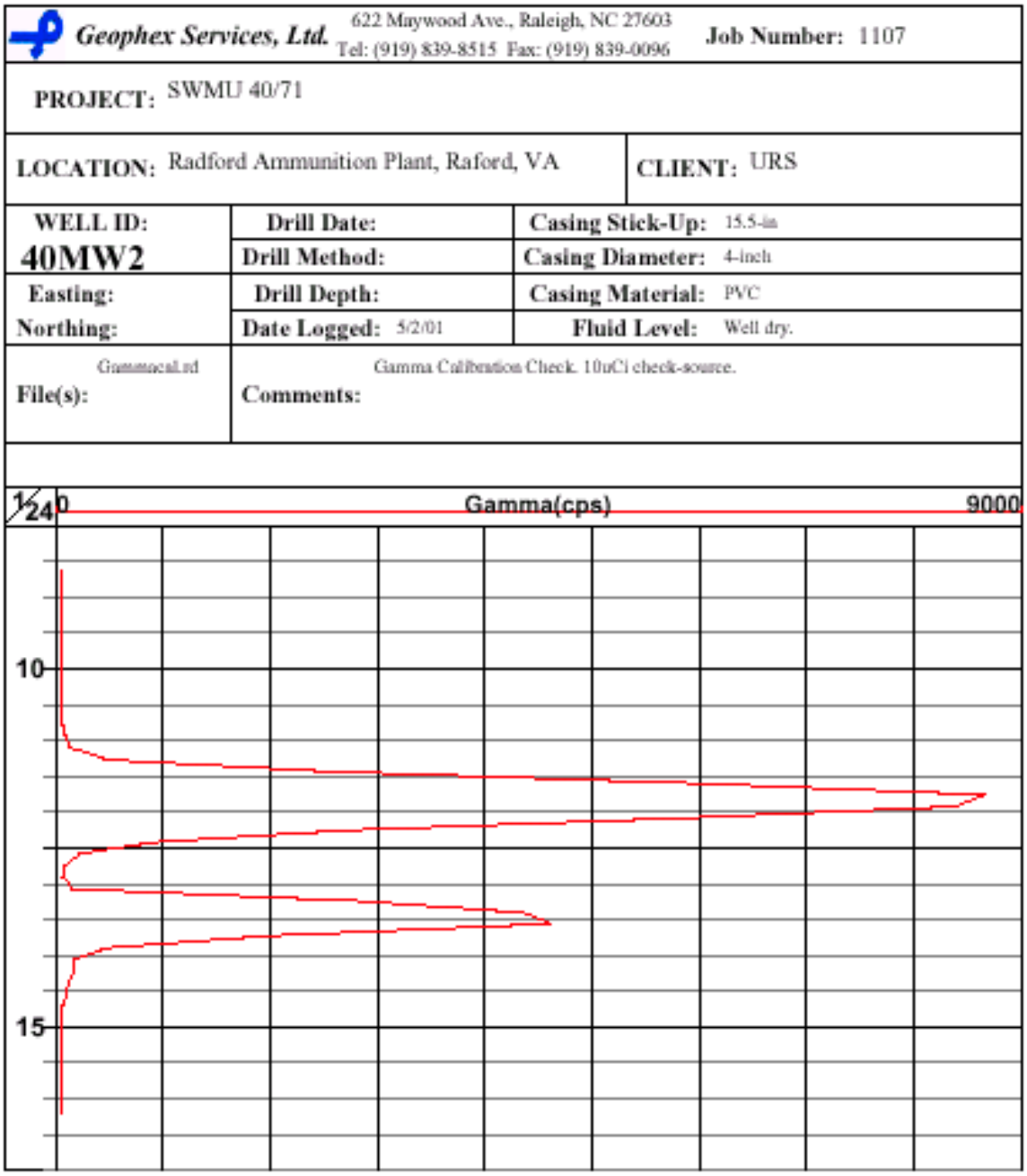


Figure D-4. Gamma tool calibration check with 10 microCurie check source.

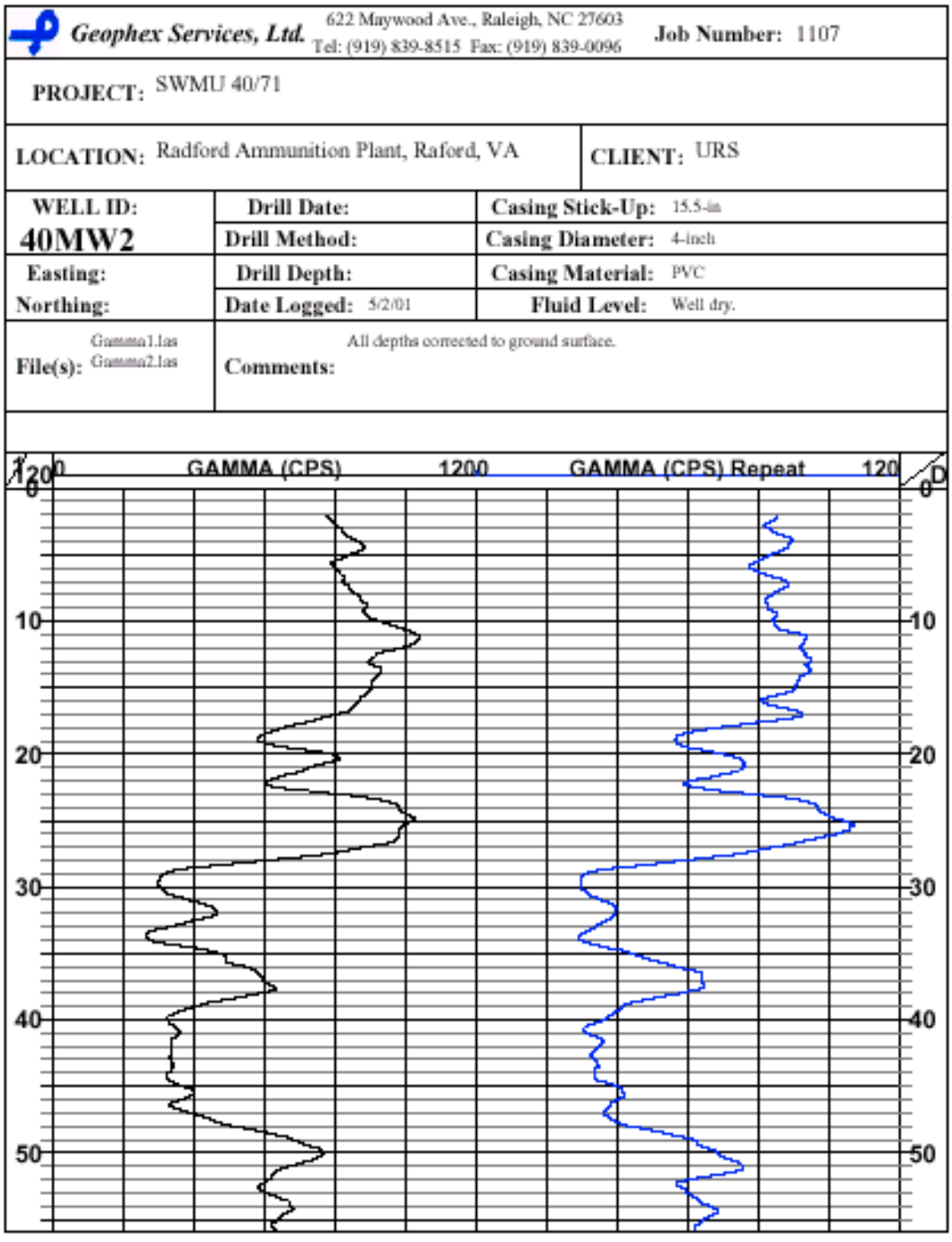


Figure D-5. Repeat gamma run for 40MW2.

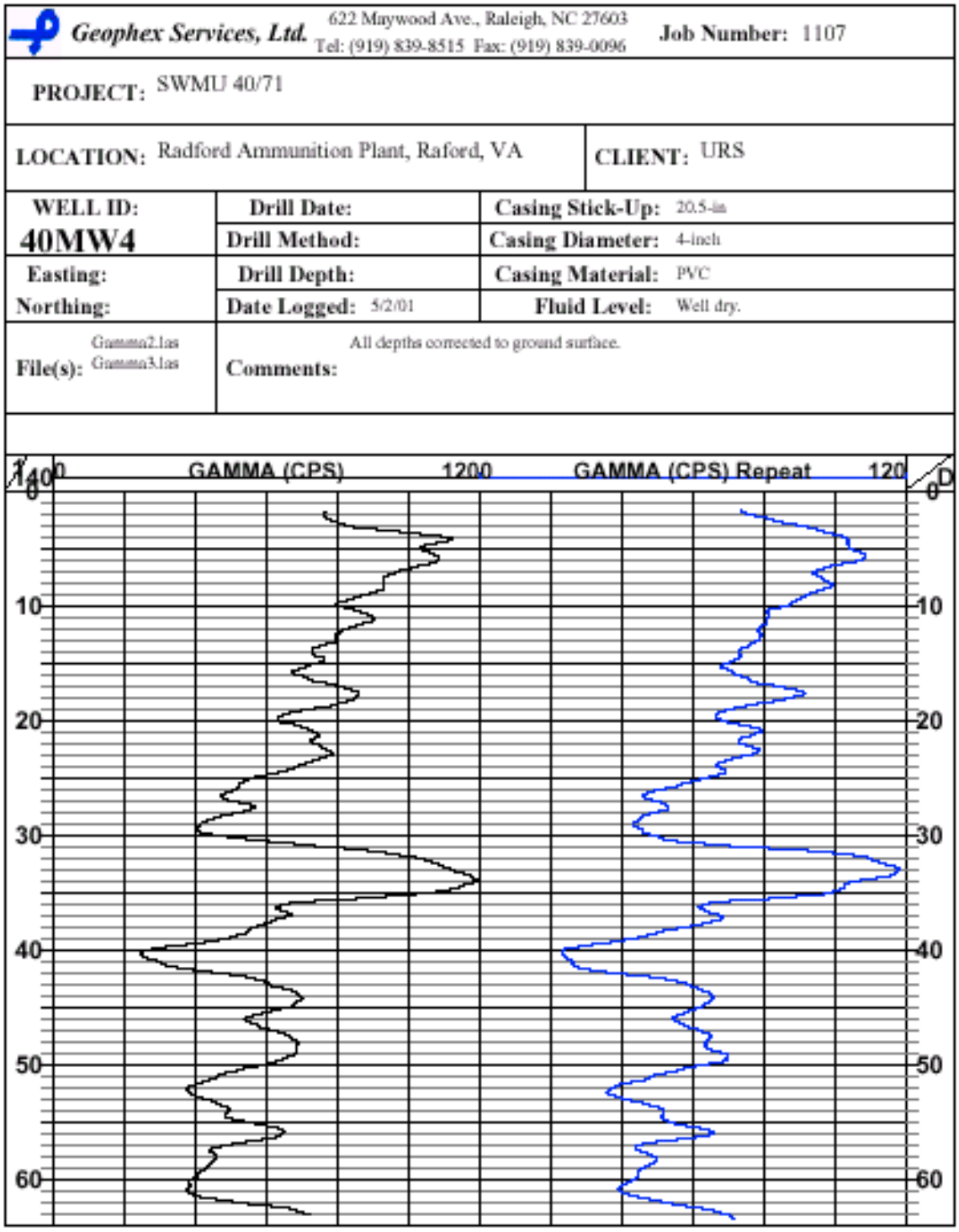


Figure D-6. Repeat gamma run for 40MW4.

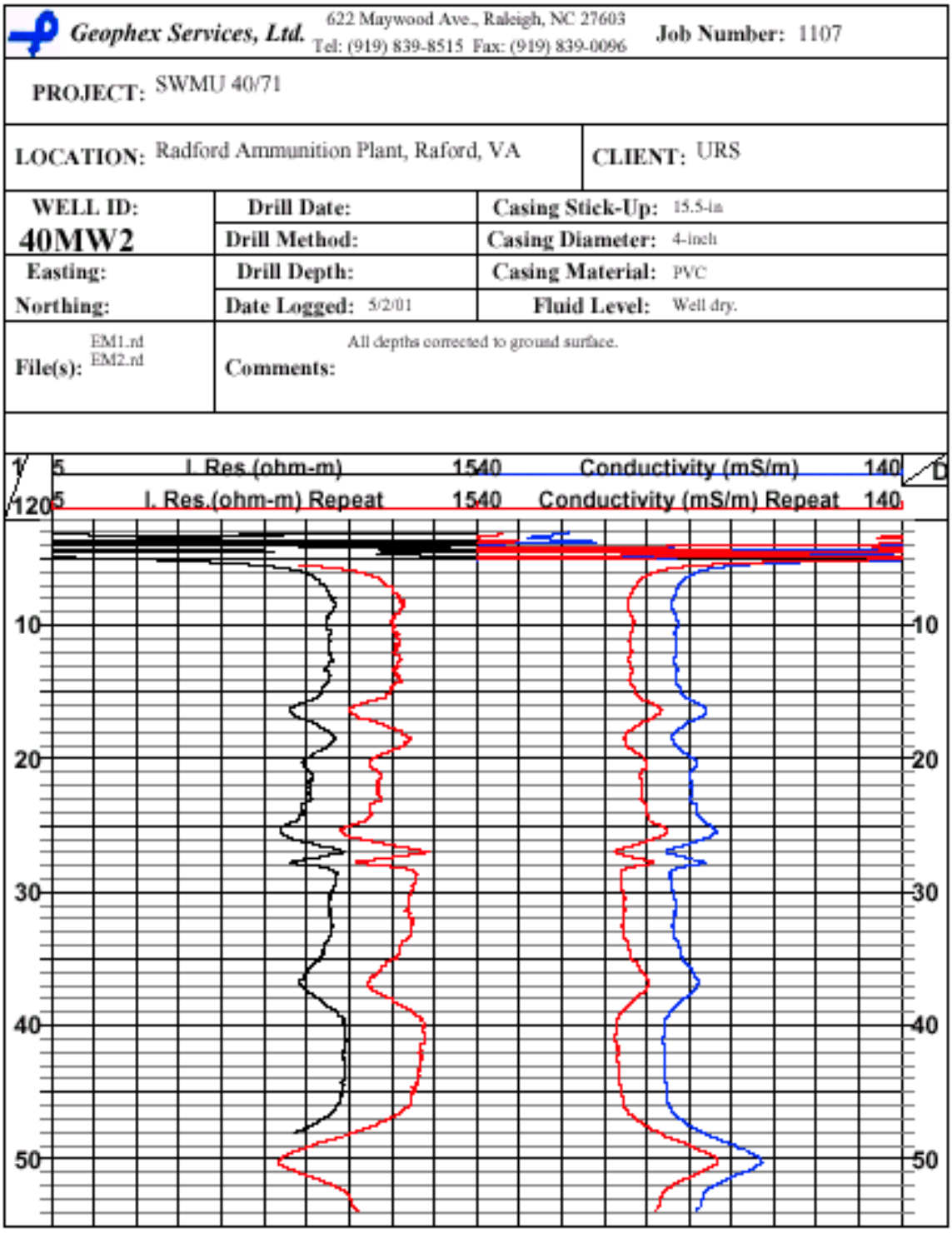


Figure D-7. Repeat EM run for 40MW2.

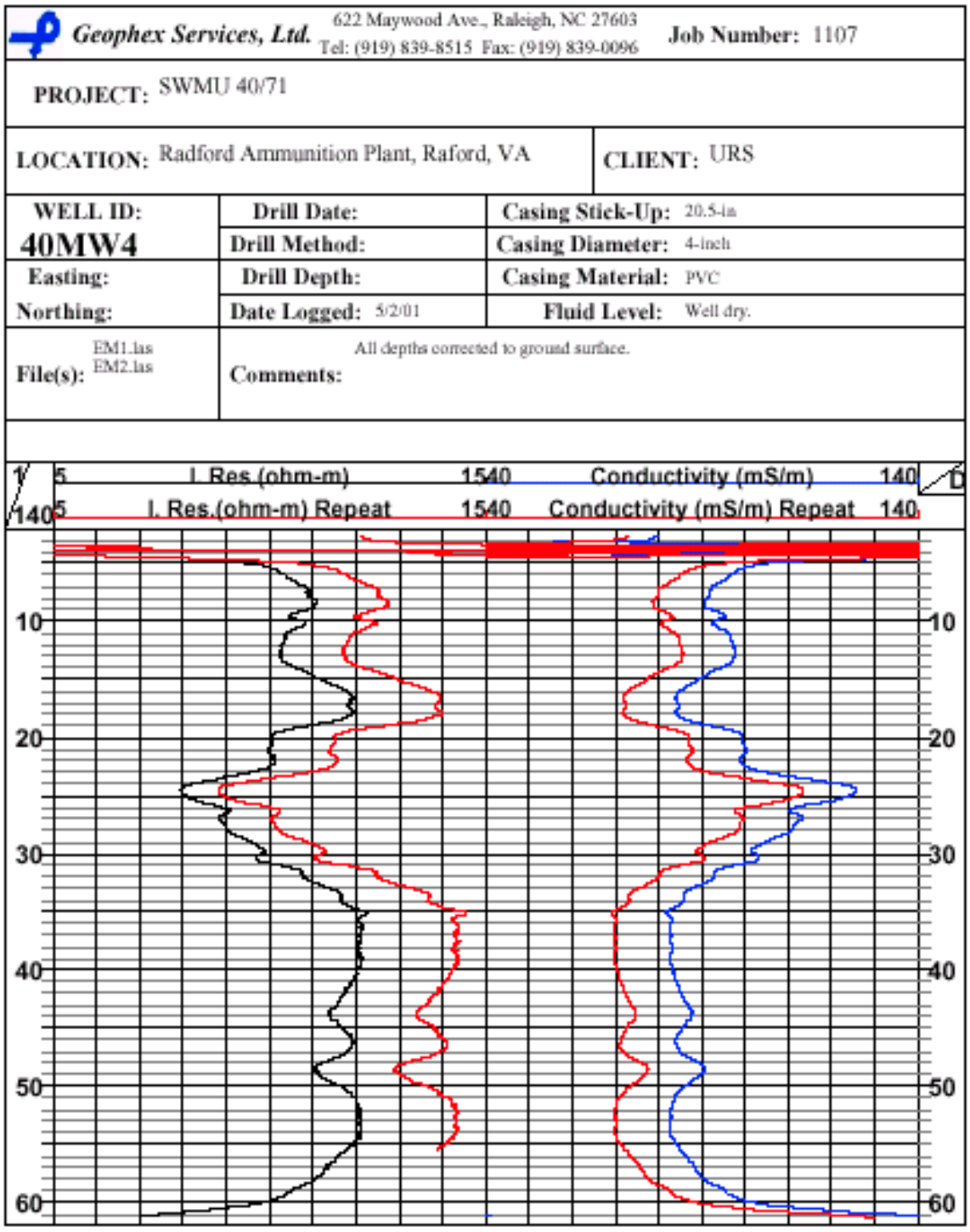


Figure D-8. Repeat EM run for 40MW4.

Appendix E
DC Resistivity Profiles for SWMU 40/71

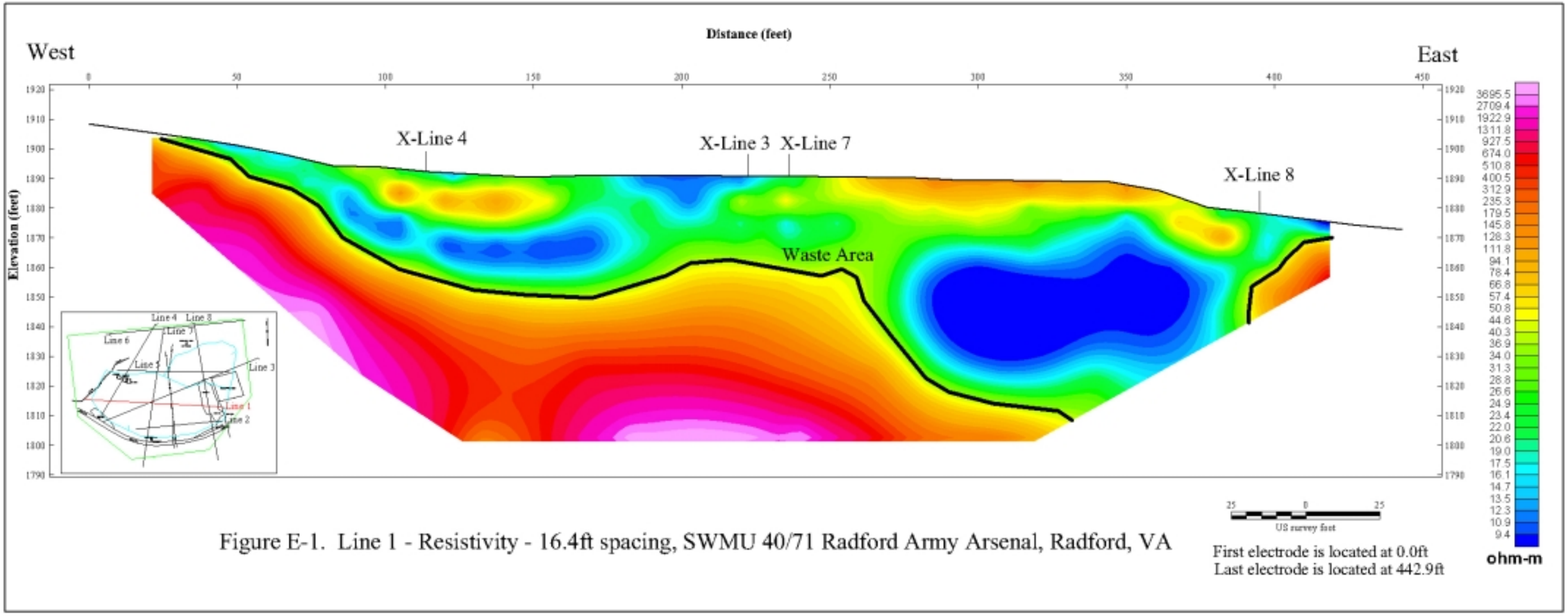


Figure E-1. Line 1 - Resistivity - 16.4ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

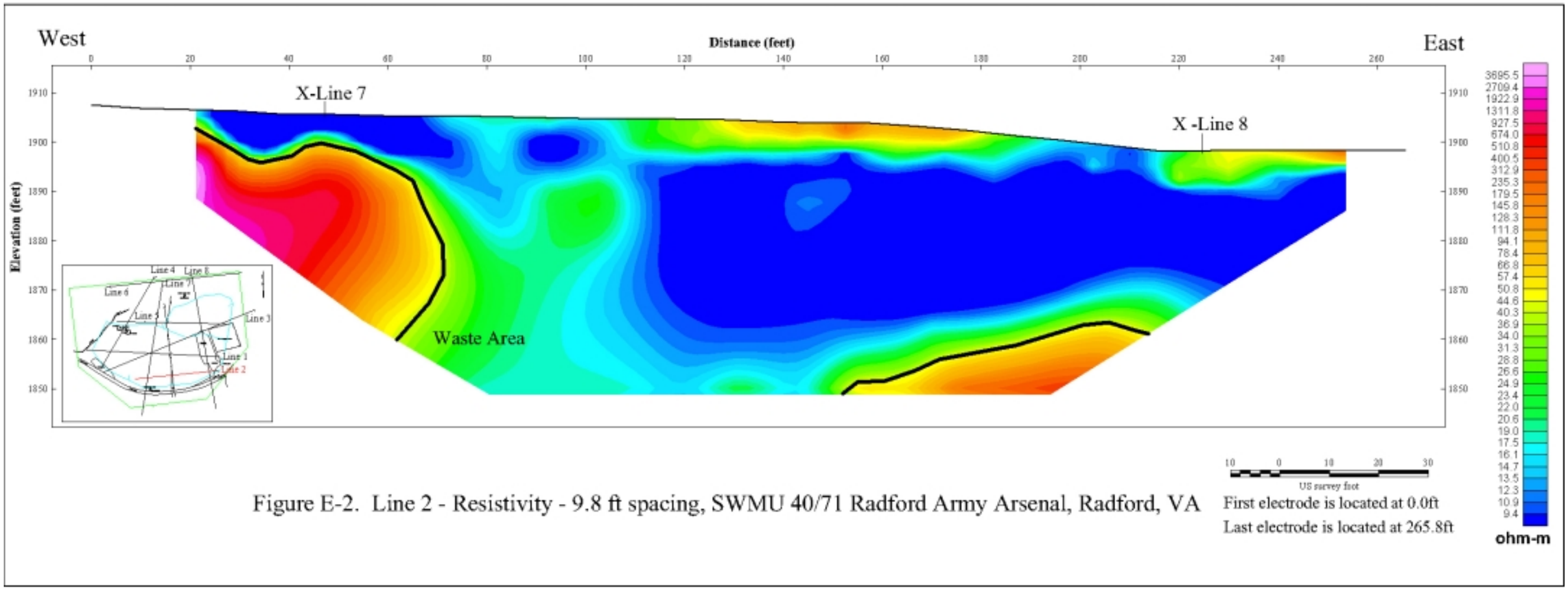


Figure E-2. Line 2 - Resistivity - 9.8 ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

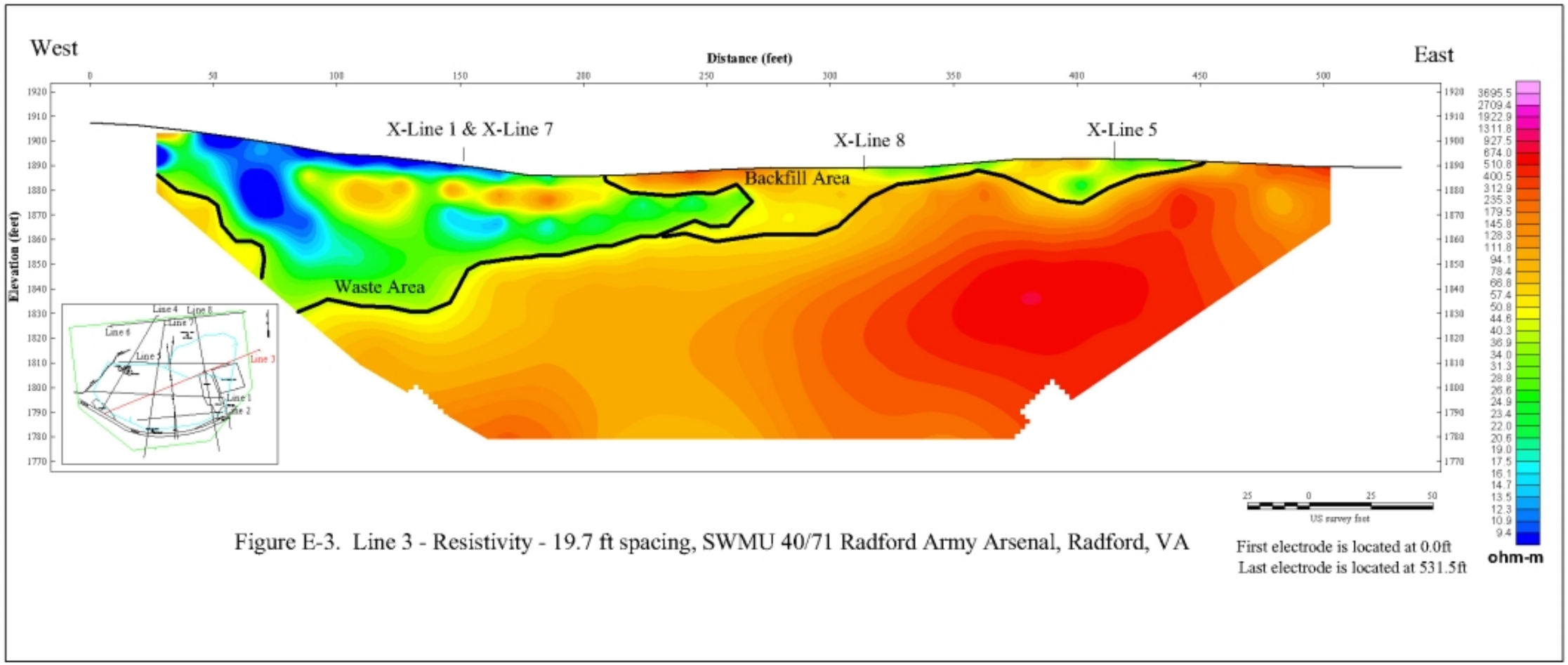


Figure E-3. Line 3 - Resistivity - 19.7 ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

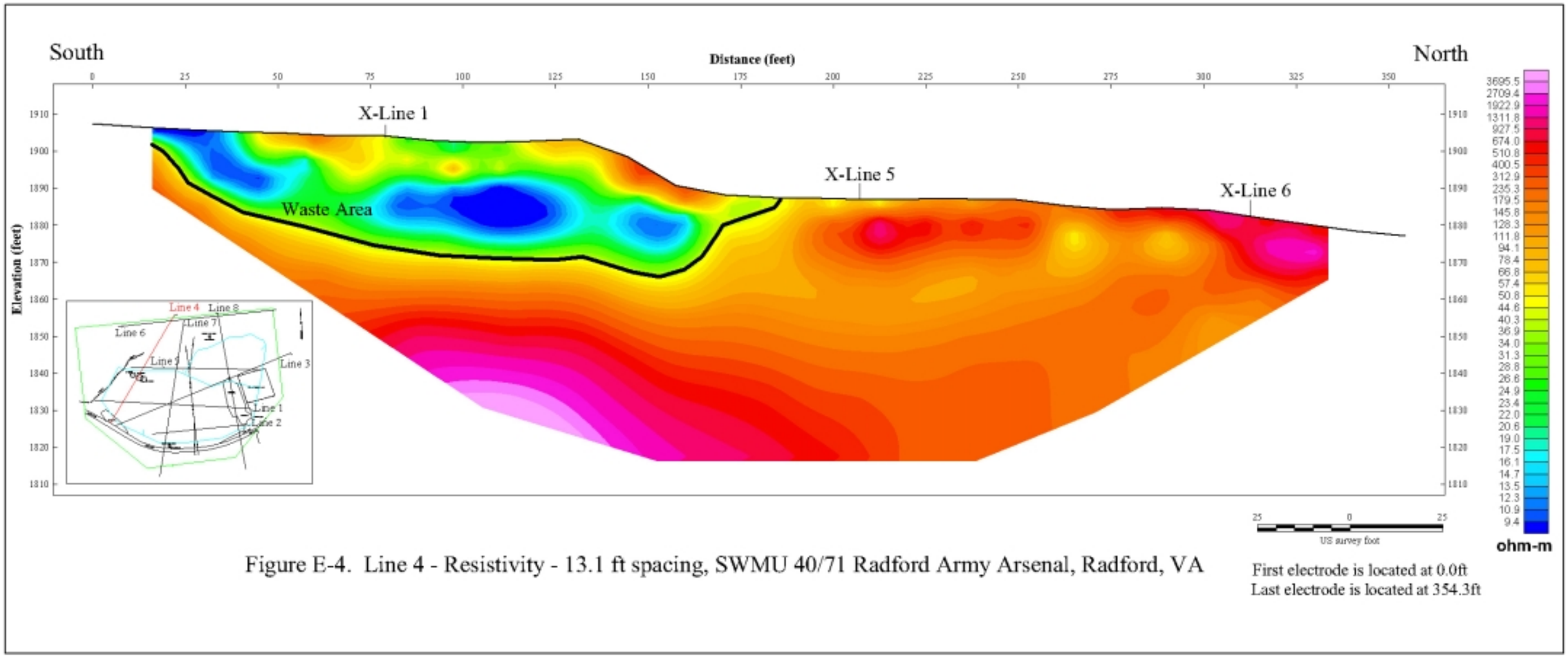


Figure E-4. Line 4 - Resistivity - 13.1 ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

First electrode is located at 0.0ft
Last electrode is located at 354.3ft

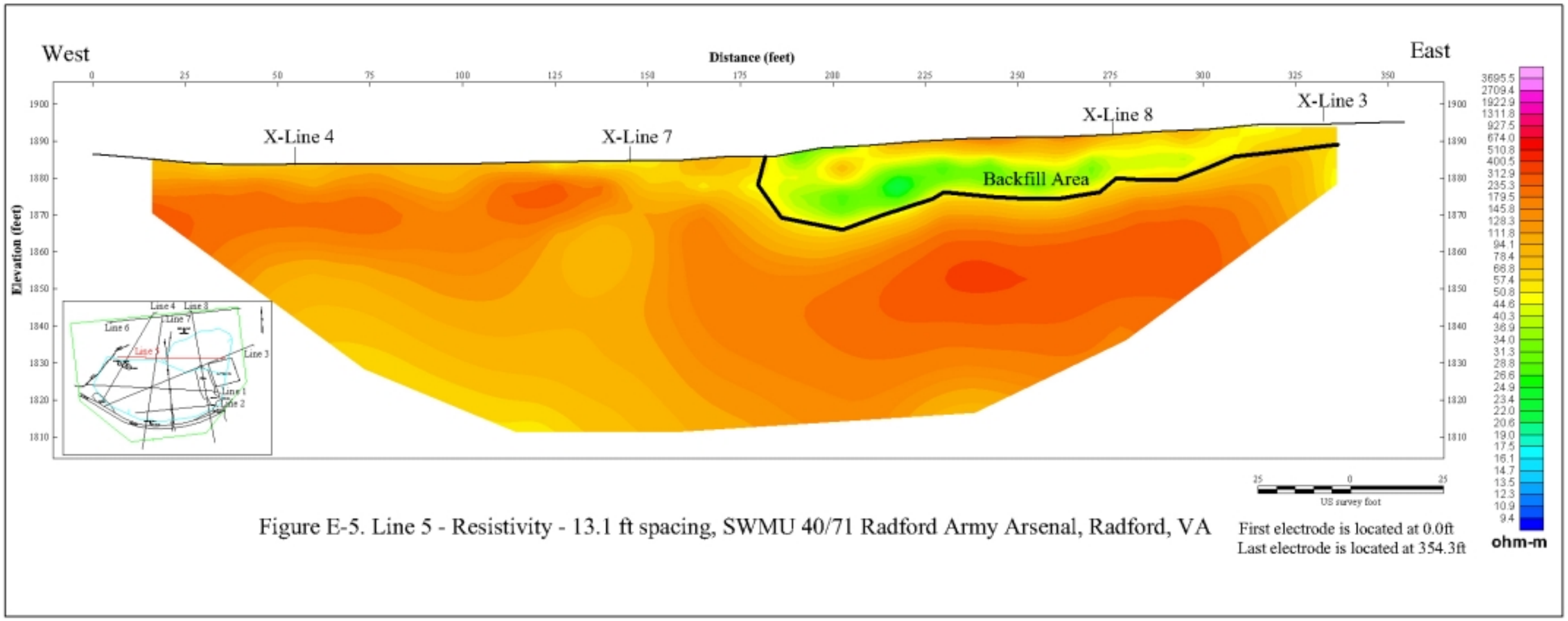


Figure E-5. Line 5 - Resistivity - 13.1 ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

First electrode is located at 0.0ft
Last electrode is located at 354.3ft

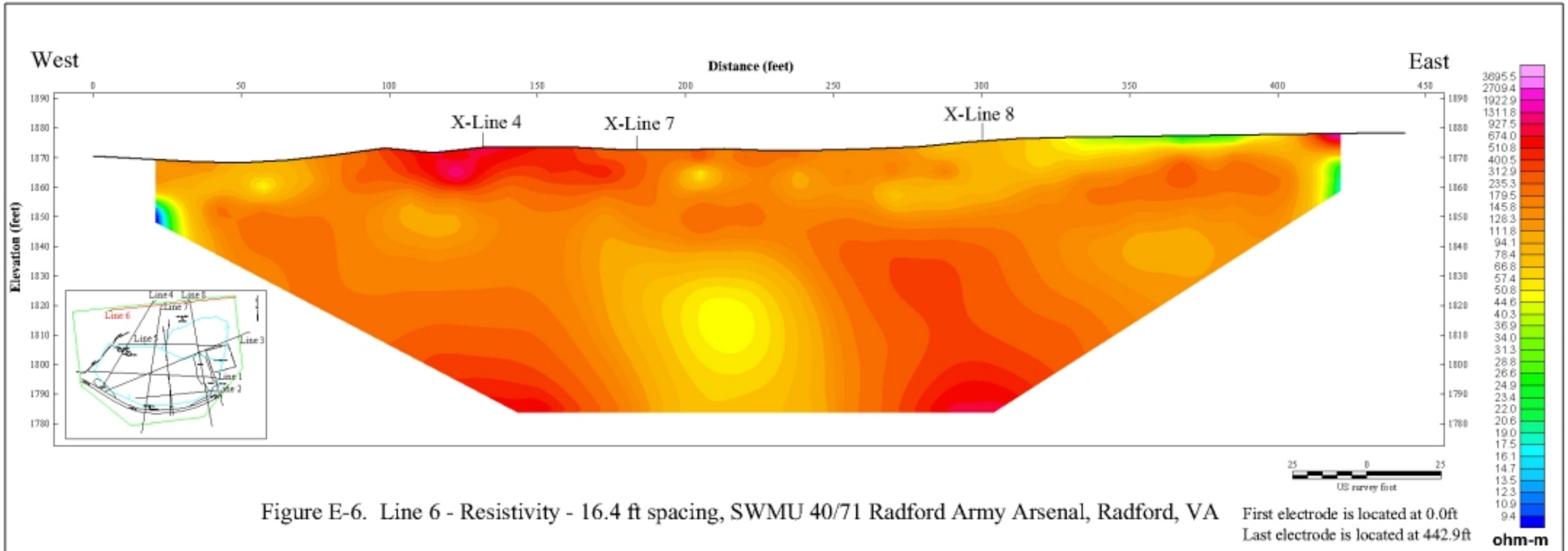


Figure E-6. Line 6 - Resistivity - 16.4 ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

First electrode is located at 0.0ft
Last electrode is located at 442.9ft

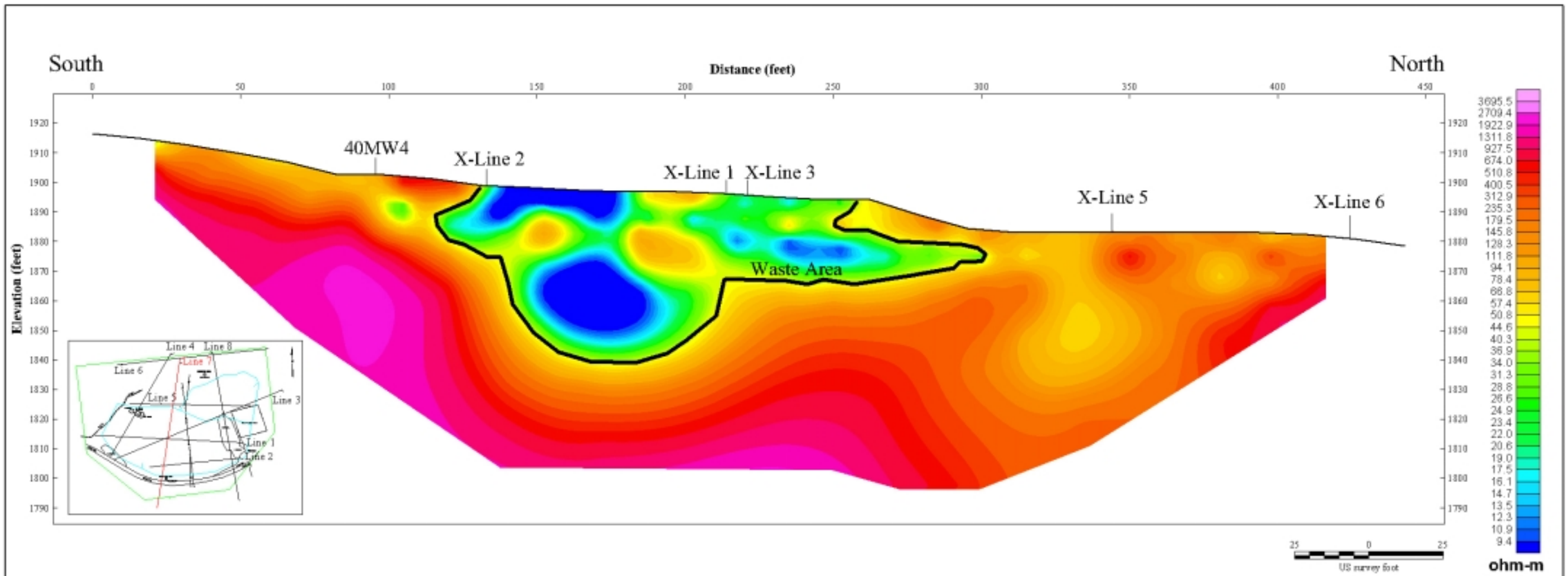


Figure E-7. Line 7 - Resistivity - 13.1 ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

First electrode is located at 0.0ft
Last electrode is located at 442.9ft

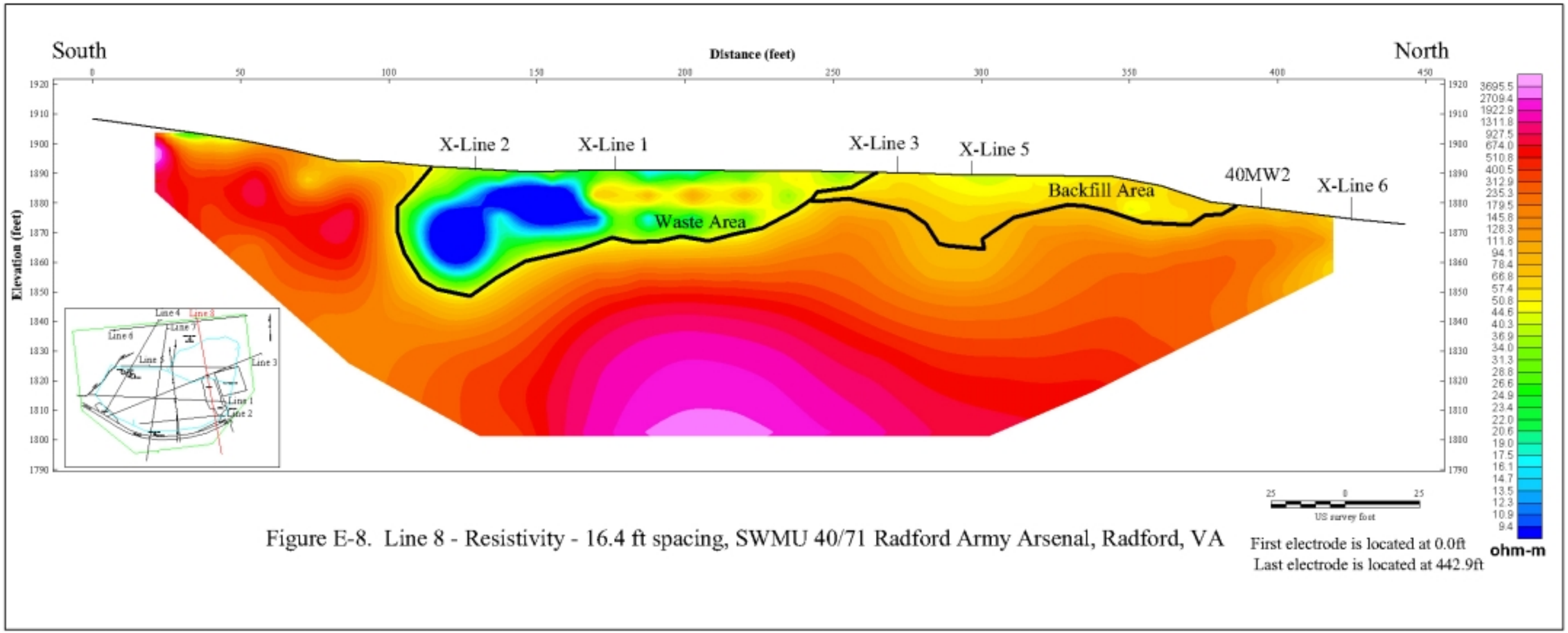
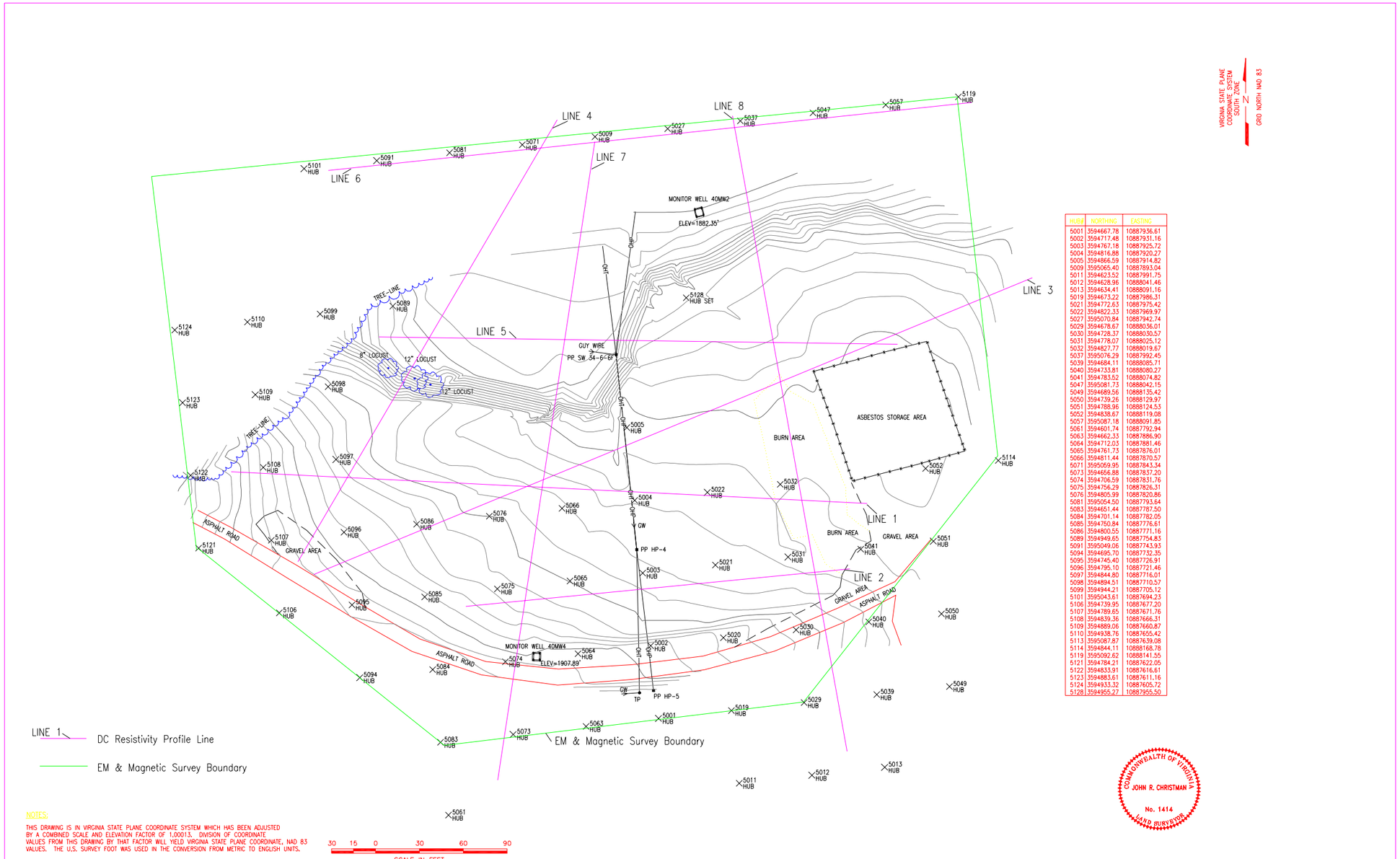


Figure E-8. Line 8 - Resistivity - 16.4 ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

First electrode is located at 0.0ft
Last electrode is located at 442.9ft

Appendix F
Larger Site and Interpretational Maps



HUB#	NORTHING	EASTING
5001	3594667.78	10887936.61
5002	3594717.48	10887931.16
5003	3594767.18	10887925.72
5004	3594816.88	10887920.27
5005	3594866.59	10887914.82
5009	3595065.40	10887893.04
5011	3594623.52	10887991.75
5012	3594628.96	10888041.46
5013	3594634.41	10888091.16
5019	3594673.22	10887986.31
5021	3594772.63	10887975.42
5022	3594822.33	10887969.97
5027	3595070.84	10887942.74
5029	3594678.67	10888036.01
5030	3594728.37	10888030.57
5031	3594778.07	10888025.12
5032	3594827.77	10888019.67
5037	3595076.29	10887992.45
5039	3594684.11	10888085.71
5040	3594733.81	10888080.27
5041	3594783.52	10888074.82
5047	3595081.73	10888042.15
5049	3594689.56	10888135.42
5050	3594739.26	10888129.97
5051	3594788.96	10888124.53
5052	3594838.67	10888119.08
5057	3595087.18	10888091.85
5061	3594601.74	10887792.94
5063	3594662.33	10887886.90
5064	3594712.03	10887881.46
5065	3594761.73	10887876.01
5066	3594811.44	10887870.57
5071	3595059.95	10887843.34
5073	3594656.88	10887837.20
5074	3594706.59	10887831.76
5075	3594756.29	10887826.31
5076	3594805.99	10887820.86
5081	3595054.50	10887793.64
5083	3594651.44	10887787.50
5084	3594701.14	10887782.05
5085	3594750.84	10887776.61
5086	3594800.55	10887771.16
5089	3594949.65	10887754.83
5091	3595049.06	10887743.93
5094	3594695.70	10887732.35
5095	3594745.40	10887726.91
5096	3594795.10	10887721.46
5097	3594844.80	10887716.01
5098	3594894.51	10887710.57
5099	3594944.21	10887705.12
5101	3595043.61	10887694.23
5106	3594739.95	10887677.20
5107	3594789.65	10887671.76
5108	3594839.36	10887666.31
5109	3594889.06	10887660.87
5110	3594938.76	10887655.42
5113	3595087.87	10887639.08
5114	3594844.11	10888168.78
5119	3595092.62	10888141.55
5121	3594784.21	10887622.05
5122	3594833.91	10887616.61
5123	3594883.61	10887611.16
5124	3594933.32	10887605.72
5128	3594955.27	10887955.50

Figure F-1. Generalized site map for the geophysical surveys at SWMU 40/71.

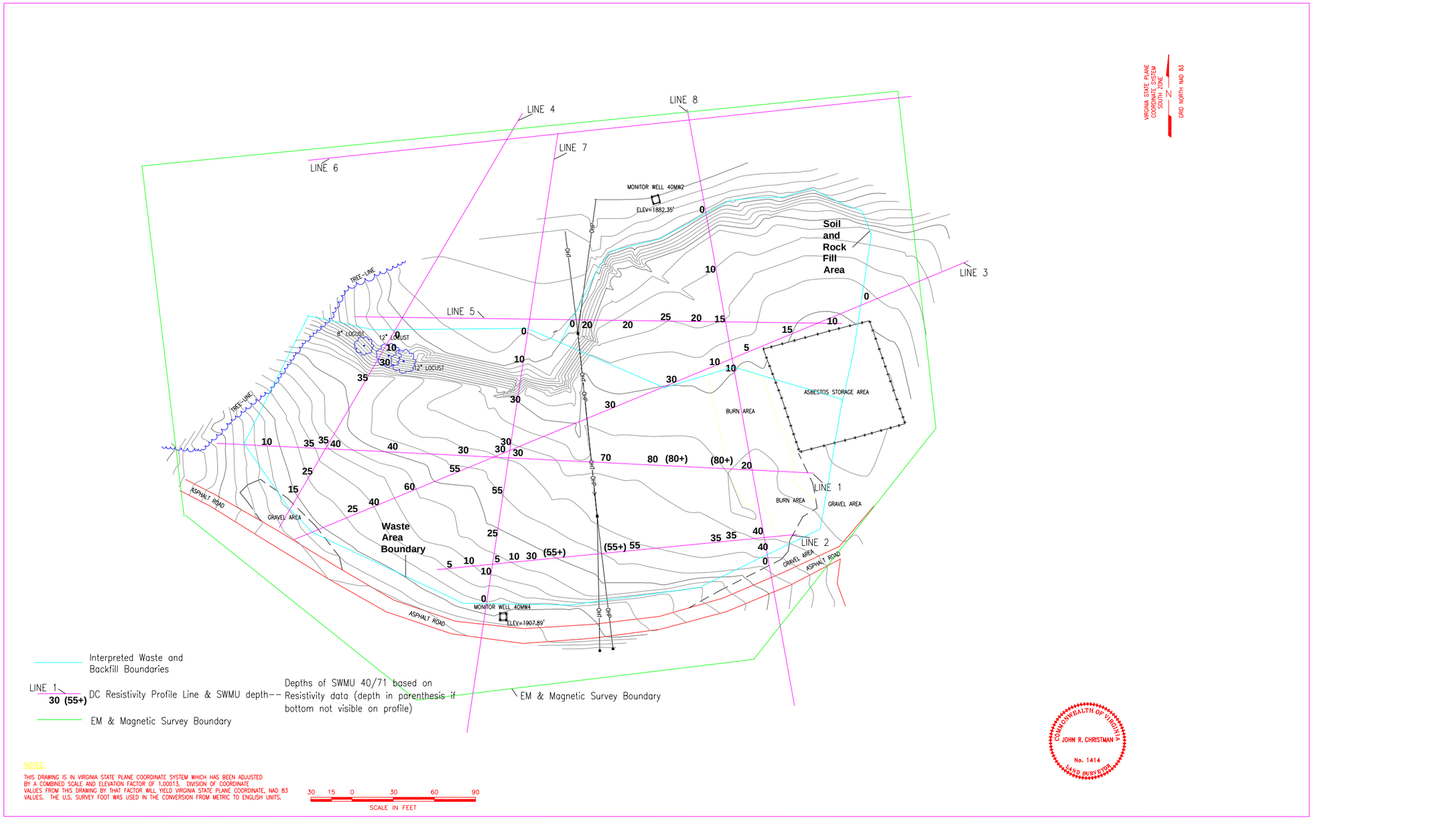


Figure F-2. Interpretation map for SWMU 40/71 waste and backfill depths.

APPENDIX D.2

GEOPHYSICAL SURVEYS: SWMU 40/71
ARGONNE NATIONAL LABORATORY, APRIL 2003

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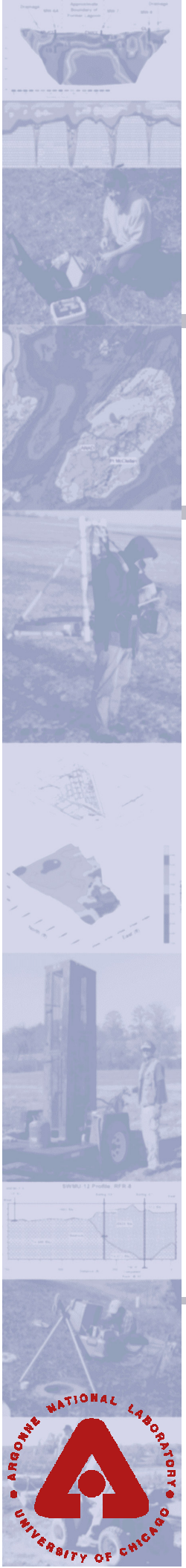

Geophysical Surveys: SWMU 40/71, Radford Army Ammunition Plant, VA.

Submitted To:

U.S. Army Corps of Engineers
Baltimore District
Baltimore, MD

April 2003

Sponsor Report

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Geophysical Surveys: SWMU 40/71, Radford Army Ammunition Plant, VA.

1. INTRODUCTION

SWMU 40/71 is located southwest of the Main Manufacturing Area of the Radford Army Ammunition Plant (RFAAP) (Figure 1). SWMU 40/71 was reportedly used as a sanitary landfill in the 1970s and early 1980s for the disposal of uncontaminated paper, municipal refuse, cement, and rubber tires, and is covered with a soil cap and grass. It is not known whether hazardous wastes or wastes containing hazardous constituents were disposed of in the landfill. During 1991-1992, a fenced enclosure for asbestos storage was constructed over the northeast corner of the SWMU. SWMU 40/71 also contains an area used between 1962 and 1982 to flash-burn metal process pipes contaminated with chemical propellants. Previous geophysical investigations by Geophex (2001) revealed the likelihood of a complex bedrock topography and geo-electric character.

This report covers surface geophysical surveys using two-dimensional resistivity profiling and seismic refraction tomography performed at SWMU 40/71 during the time period of August through September 2002 by Argonne National Laboratory (ANL). Additional borehole velocity measurements were collected in 2 monitoring wells adjacent to SWMU 40/71 to help guide the seismic interpretations, and downhole electrical and natural-gamma logging surveying was collected by USACE staff to help constrain the resistivity models.

2. OBJECTIVE

The primary objectives for SWMU 40/71 were to provide verification of the existing geophysical models, assess the top-of-bedrock beneath the site, and assist in further defining both the lateral and vertical extent of the former disposal activities. Information obtained by the geophysical surveys will be used in developing plans for any follow-on focused studies relative to for potential constituents in soil.

3. TECHNICAL APPROACH

Site conditions and remediation goals are critical in determining what geophysical techniques are appropriate for an investigation. RFAAP is underlain by carbonate rock (limestone and dolomite) that in places is structurally complex (folded and faulted) and contains clastic interbeds and tectonic breccias. Overburden sediments range from 0 to 60+ feet in thickness, and in landfill areas, the overburden may contain a considerable thickness (>10-ft) of debris associated with waste disposal activities.

Geophysical investigations provide subsurface geologic information using non-intrusive techniques, the data from which are often times interpreted in more than one way. Therefore, the use of two or more geophysical methods, plus the integration of available geotechnical information, allows for a more constrained interpretation of the geophysical data.

Two-dimensional electrical resistivity imaging (2D-ERI) and seismic refraction profiling/tomography are applicable techniques that can map changes in the electrical (2D-ERI) and acoustic (seismic) characteristics of the underlying soil and rock. These

techniques provide complementary information about the subsurface, which can provide a more definitive interpretation of subsurface anomalies over that obtained using the techniques individually. A more detailed description of the theory and operation of these methods are given in the Geophysical Methods section.

In general, the underlying rock should have a higher seismic-velocity than the overburden sediments, and should be readily distinguishable on the resulting tomographic sections. A decrease in seismic velocity will occur where the rock is fractured (weak zones), less competent, or dominated by solution cavity development.

The electrical response of the rock is more complex and depends on the type of strata present and the electrical properties of the pore fluid. Higher electrical-resistivity should occur if carbonate rock is present. Alternatively, the presence of an electrically conductive pore-fluid, or a significant clay fraction, could yield lower-resistivities than expected. Air-filled fractures and voids would likely increase the electrical resistivity.

The initial Geophex surveys used a Virginia licensed land surveyor to establish a local grid system at SWMU 40/71. Profile locations for this investigation were based on measuring off known points from the existing survey, and on using a differential GPS to locate the end points of the individual profile lines. Positional information was converted to the US State Plane, NAD-83, US Survey Feet datum, and were crossed checked by overlaying onto the existing GIS base map.

4. Geophysical Methods

Geophysical methods used in this investigation consist of two-dimensional electrical resistivity imaging (2D-ERI), seismic refraction profiling (tomographic and earth-layer solutions), and vertical seismic profiling (check shots). The Radford specific standard operating procedure for geophysical surveys (SOP 20.7) only covered EM surveys, and provided guidelines for both vertical and horizontal electrical resistivity profiling (not the full two-dimensional surveys used for this investigation). In order to meet data quality and project objectives, the following guidelines developed through ASTM were used in the construction and implementation of the geophysical surveys; ASTM-D6431-99 for 2D-ERI profiling, and ASTM-D5777-00 for the seismic-refraction surveys. Vertical seismic profiling was conducted following specific sections of ASTM-D65777-00 and ASTM-D4428M-00 (cross-hole surveys) that deal with the emplacement of receivers within a borehole, the selection of appropriate energy sources, and the parameters for recording the seismic signal. Appropriate sections of the USACE (1995) manual describing geophysical investigations was also used for the design and implementation of geophysical surveys used in this study.

2D Electrical Resistivity Imaging

Two-dimensional electrical resistivity imaging (2D-ERI) measures horizontal and vertical variations in the electrical-resistance of the subsurface. For the Radford Army Ammunition Plant, the underlying carbonate rock was expected to be of higher-electrical resistivity than the overburden sediment, though the presence of conductive fluids or significant clay fraction would tend to decrease the resistivity. In addition, weak or fractured zones within the carbonate rock should display changes in electrical character,

from either an increase in resistivity for air-filled regions, to a decrease in resistivity for clayey intervals. The trench work within the overburden sediment is expected to produce a zone of lower electrical resistivity. In addition, the presence of waste material and degradation products may also lower the electrical response in the vicinity of the trench.

The Advanced Geosciences, Inc. (AGI) Sting/Swift™ system is an automatic multi-electrode system and earth resistivity meter that acquires data by passing an electric current between two electrodes and measuring the potential difference (voltage) between them. The measured voltage is a factor of the resistance of the earth material and the geometry of the electrode array (e.g. dipole-dipole, Schlumberger). Resistivity, an intrinsic property of the earth, is then calculated using the measured voltage, the amperage, and a geometric factor for the electrode array. The calculated resistivity value is actually an "apparent-resistivity" because it includes the resistances of all the material that the electrical current passes through. A modeling procedure is then used to convert the measured apparent-resistivity data into earth-layer resistivity sections.

The electrodes used to measure the voltage difference are arranged in various geometries called arrays, and the calculated apparent-resistivity value is interpreted to represent a depth point at the center of an individual array. Depth of measurement is related to width of electrode separation, with greater electrode separation resulting in greater depths of penetration. Classically, two different techniques are used to determine the electrical resistivity of earth materials. In vertical electrical sounding (VES), electrodes are expanded about the center of an array to generate a layered electrical section at a single point (vertical profile). The lateral profiling technique uses an array with a fixed electrode separation, which is marched along a line to image lateral variations at a constant depth.

Two-dimensional electrical-resistivity imaging (2D-ERI) combines VES and lateral profiling into a single survey without the time-consuming process of constantly moving electrodes and reconnecting cables. In 2D-ERI a single cable connects a linear array of electrodes, which are turned on and off using a preprogrammed sequence via a controller box. The raw apparent-resistivity data are typically displayed as a pseudosection where the lateral position of the measurement point is placed at the center of the corresponding electrode array, and the depth of the measurement increases with increasing electrode spacing. Apparent-resistivity pseudosections are useful for performing quality-control checks and for examining whether manmade objects (e.g. buried utilities?) have impacted the data set.

Apparent-resistivity pseudosections are converted, through a process termed inversion, into an electrical-resistivity cross-section showing true earth-layer resistivities. RES2DINV (Loke, 1996), a commercially available program, was used to perform the two-dimensional inversion modeling. During the inversion, the subsurface is divided into a number of blocks equal to or less than the number of measurement points. A smoothness-constrained, least-squares inversion routine is used to estimate the resistivity value of each block, and finite-element or finite-difference forward modeling is used to calculate the resulting pseudosection. The model is iteratively corrected until an apparent-resistivity pseudosection calculated from the model converges with the measured apparent-resistivity pseudosection. A root-mean-square (RMS) error calculation of the difference between the two apparent-resistivity pseudosections is used

as a measure of the degree of fit for the model. Maximum convergence often occurs within 3 to 5 iterations, after which RMS values do not change significantly and the model may start to become unstable.

Seismic Refraction Tomography

Seismic refraction provides acoustic velocity and layer depth information (Redpath, 1973). The refraction method generally depends on an increase in seismic-wave velocity (speed of sound through earth material) with depth, though the newer tomographic codes presently available have the capability of handling a velocity inversion (zones of lower seismic velocity underlying zones of higher velocity). Both a tomographic model and an earth-layer (refractor) cross-section were implemented as processing outputs from the refraction profiling. The commercially available SeisOpt2D (Optim, 2001) code was used to construct the tomographic model, and the SIPT2 (RimRock, 1992) software package was used to generate the earth-layer cross-section.

In the refraction method, the seismic energy (or wave) bends (refracts) at interfaces between layers of different velocities. In the special case where the seismic wave has been refracted parallel to the interface, the seismic energy travels along this interface, generating a head wave that returns to the surface. A linear array of acoustic receivers (geophones) was used to record the travel-time of the first returning seismic signal. This information was plotted on a time-distance graph; for the case of plane layer geometry, the time-distance plot will show distinct linear segments for each layer where the inverse of the slope of a segment is equivalent to the apparent seismic velocity for a particular layer.

A multi-channel, engineering seismograph was used to record the seismic refraction information, and either a 500-lb weight drop elastic wave generator (EWG) or a 16-lb. sledgehammer were used as the energy source. Geophones (acoustic-receivers) were spaced at a 3ft interval during surveying. Shot points were acquired at every fifth geophone position, which allows input to the tomographic modeling software.

The processing sequence for the refraction data consisted of:

- Picking first arrival times of return energy for each shot;
- Assigning the array-geometry to the first arrival data;
- Inverting the first-arrival information for velocity and depth using the SIPT algorithm (delay-time method); and
- Constructing a tomographic model of the first-arrival information using the SeisOpt2D code available from Optim Software.

The SIPT method took advantage of the reverse-spread geometry and far offset shot points of the survey to compute depths to interfaces below each geophone. The algorithm employed the delay-time method of Pakiser and Black (1957) to calculate depth and position of refraction horizons. The generated refraction model was further refined using a ray-tracing algorithm which overcomes difficulties associated with dipping or undulating horizons.

The SeisOpt2D software achieved a globally optimized, velocity model using only first arrival travel time data and array geometry as input. SeisOpt2D required no prior assumptions of subsurface structure, or any other subjective data, as input. A controlled Monte-Carlo inversion method was employed where the derived models were conditionally accepted or rejected based on a probability criterion. The criterion allowed the algorithm to escape from non-unique, local, travel time minima to achieve a unique, globally optimized model of subsurface velocity structure. The algorithm made no assumptions on the orientation of the subsurface velocity gradient, and could therefore reveal vertical structures and strong lateral gradients, if present.

Borehole Velocity Survey

Borehole velocity surveys (check shots) were used to measure the in-situ velocity of the sediment and rock penetrated by adjacent and/or nearby wells. These data provided confirmatory velocity information for the refraction models. The general configuration for recording the downhole seismic data consisted of a three-component geophone, implementing 40Hz receiver elements. The downhole geophone was moved in 5-ft increments within the borehole (5-ft receiver spacing). A sledgehammer was used as the energy source, and is placed at offsets up to 15-ft from the borehole. Three additional geophones were placed on the surface at offsets up to 20-ft from the borehole, and are required to resolve any shot-timing variations that occur when using impact sources.

The velocity of the earth material and the type of well construction used governs the placement of the sledgehammer source, vertical spacing of the downhole receiver, and the sampling rate. The objective was to record a seismic signal that has been transmitted through the earth, and not along the borehole wall or borehole casing. This required offsetting the shot point from 5 to 15 ft from the borehole so that the velocity of the near surface material (upper 30 ft) could be measured.

The vertical spacing used was primarily dependent on expected velocities within the subsurface, and the recording limitations afforded by the seismic gear. Data recorded at the 0.1 ms interval (10,000 samples per second) used for RFAAP allowed discerning arrival time changes as small as 0.2 ms (twice the sampling interval). Given an expected velocity range of 10,000 to 25,000 ft/s, the 5 ft spacing used yielded theoretical arrival time changes from 0.2 to 0.5 ms.

Data processing consisted of the following:

- Picked first arrival energy for the downhole and reference geophones;
- Sorted the arrival-time data by depth point;
- Computed and apply shot-timing corrections using the arrival time picks obtained from the reference geophones;
- Computed the average velocity to a receiver station using the straight-line distance from the shot to the receiver and the corrected arrival time;
- Converted to vertical travel-time using the depth point for the receiver and the computed average velocities; and

- Computed interval velocities using least squares line-fitting algorithm to estimate the slope (inverse of velocity) between measurement points. The least-squares operator has the advantage of smoothing over small time-picking errors.
- Where available, the data were correlated with the lithologic information and other available borehole geophysical data.

5. Geophysical Surveys

Geophysical surveys were conducted along 4 profiles at SWMU 40/71 (see Figure 1). Both seismic and resistivity data were collected along Profile ANL L-2, which connects wells 40MW2 and 40MW4 and uses the well log information as a basis for interpreting the geophysical data collected at SWMU 40/71. Seismic data was also collected along profile ANL L-1, which is tied to well 40MW2 and can be used as a tie line for Geophex profiles L-1 and L-8. 2D-ERI data were collected for profiles Geophex L-1 and Geophex L-8, in order to confirm the geophysical models constructed by Geophex (2001). Interpretation of the resistivity models for these latter two profiles was based on results for lines ANL L-1 and L-2.

Borehole Velocity Surveys

Borehole velocity surveys were conducted in well 40MW2 to a depth of approximately 57 ft, and in 40MW4 to about 64 ft with the results shown in Figures 2 and 3. Highly weathered rock was encountered in both wells, with 40MW2 underlain by "softer zones" at depth. The corresponding velocity log for 40MW2 shows an increase in velocity from 1900ft/s (580m/s) to 5000ft/s (1500 m/s) at a depth of approximately 25 ft, with a thinner zone of higher velocity at 5-to-15ft also present. At depth (below 45 ft), the velocity log indicates a relatively low-velocity material (<2000 ft/s), which most likely corresponds with the "very soft, very weathered" silt and clay zones encountered. Well 40MW2 is most likely penetrating weathered bedrock.

The velocity log for 40MW4 shows an increase in velocity from 2500 ft/s (770 m/s) to greater than 10,000 ft/s (>3300 m/s) at a depth of approximately 25 ft. This likely represents a change from overburden/weathered rock to more competent rock. Velocities of 10,000 ft/s generally correlate with limestone of soft to intermediate hardness (Press, 1966). An interval of lower velocity is indicated at 45 ft in depth, which corresponds to a zone where coring was stopped due to excessive water loss, and where cuttings did not return to the surface.

Profile ANL L-2

Profile ANL L-2 is oriented roughly southwest-to-northeast, and connects with wells 40MW2 and 40MW4 (Figure 1). Both dipole-dipole and Schlumberger array data were collected for the 2D-ERI profile, and the seismic survey used a 3-ft geophone spacing and a 16 ft shot points interval. Borehole velocity logs were collected in Wells 40MW2 and 40MW4; downhole electrical induction and natural gamma surveys of these wells were performed by USACE staff. The resulting geophysical models constructed for Profile ANL L-2 are shown in Figure 4, with the seismic model in the upper panel and the resistivity models in the bottom two panels. Shown are intersections with profiles

Geophex profiles Line-1, Line-2, Line-5, the positions of wells 40MW2 and 40MW4, and the results from the borehole geophysical surveys.

The seismic tomography model is shown in the top panel of Figure 4 with magenta colors representing zones of lower velocity and green to red colors, higher velocity. The borehole velocity surveys are scaled and shown as brown trace lines at the positions of the well. Two contour values, 4920 ft/s (1500 m/s) and 2625 ft/s (800m/s) are highlighted as heavy black and gray lines, and used to provide a reference point for comparison between the seismic and resistivity models. The gray highlighted contour line is interpreted to represent the top of the weathered rock, and the black highlighted contour line, the top of competent rock.

The borehole velocity and drilling logs were used to corroborate this interpretation. At well 40MW4, the interpreted top-of-rock is present at the approximate depth where the increase in velocity occurs on the velocity log. Below this depth, the seismic model predicts velocities of >7700 ft/s (2250m/s) whereas the velocity log shows a range from 5500 to 12000 ft/s. The gray contour line (2625 ft/s) crosses well 40MW2 where top-of-weathered rock can be inferred from the borehole velocity log and driller's report. Here, borehole velocities of approximately 5000 ft/s were measured in the 25 to 50 ft depth interval. The tomographic model indicates a range in velocity from 3400 to 6300 ft/s within this interval.

Based on this interpretation, a maximum depth of approximately 40ft to top-of-competent rock is predicted near profile coordinate 150X. The bedrock surface rises towards ground level to the south, and likely reaches the ground surface south of 40MW4 where outcrop was observed during the field survey. An elevation of approximately 1870 ft (AMSL) is predicted at 40MW4.

North of 150X, the bedrock surface is relatively horizontal, showing an increase in the thickness of the weathering horizon. Near 40MW2, the surface of the competent bedrock appears to decrease rapidly in elevation, as shown by the lower velocity (and softer) material observed in the well at depth.

The 2D-ERI models (bottom two panels of Figure 4) map zones of higher resistivity (> 500 ohm-m) on both the north and south ends of the profile at depths consistent with where the borehole and seismic data place the top-of-rock. These higher resistivity zones are interpreted as representing rock, and this interpretation is extended in to the middle part of the profile. South of well 40MW4, the resistivity models predict bedrock to be close to or at the ground surface, which is corroborated by visual observation of bedrock outcrops in this vicinity.

Towards the north, the position of the bedrock surface predicted by the resistivity models is in fair agreement with that by seismic data. At well 40MW2, both resistivity models indicated higher resistivities at the same depth that increased resistivities were measured by the downhole logging. A decrease in the gamma response also occurs here, indicating a decrease in the amount of clay material present.

The position of the zone of lower resistivity in the central part of the profile is the major discrepancy between the geophysical models. The dipole-dipole resistivity-model (middle panel, Figure 4) indicates low resistivity (<20 ohm-m) to depths of 70-to-80 ft

below ground surface between coordinates 50X and 125X. However, at this location both the seismic and Schlumberger resistivity data predict a bedrock depth of 20-30 ft. The Schlumberger model maps a zone of intermediate resistivity (<100 ohm-m) between coordinates 150X and 225X that could be interpreted to represent a zone of "weak" rock. Here, the dipole-dipole solution indicates high resistivity (>500 ohm-m), and both resistivity models indicate a horizon equivalent with where the seismic model places top-of-rock.

Discrepancies such as the above are commonly observed between resistivity models of different vintages, array types, and sensitivity to subsurface conditions. This requires viewing anomalous zones on the resistivity sections with caution, and only fully accepting the size and breadth of such features where other data support such an interpretation. For example, the low-resistivity zone mapped by the dipole-dipole model at 50-125X is most likely over-extrapolated both vertically and laterally. Taken by itself, the dipole-dipole model could be interpreted to indicate a thick pile of waste. However, the seismic bedrock surface cuts through this low and forces the interpretation to presume that clay zones, or other sources of low-resistivity, are present within the rock. E.g., a large amount of conductive waste (high metal content) could bias the resistivity data in this area to represent a broad zone of low-resistivity.

Profile Geophex L-1

Profile Geophex L-1 was reoccupied by ANL during September 2002 using the same acquisition and array setup used in the original Geophex survey. A dipole-dipole electrode array and 16 ft electrode spacing was used to collect the 2D-ERI data. The profile is oriented approximately west-to-east, and crosses an anomalous area on the electromagnetic and magnetic maps interpreted to be associated with past disposal activities (Geophex, 2001). Stakes marking the endpoints of the original profile were not found during resurvey. Thus, the resurvey used endpoints measured off the supplied CAD drawing, which are estimated to be within 3-to-6 feet of the original Geophex location.

The original published resistivity model for L-1 is shown in Figure 5 (Geophex, 2001, Figure E-1). A broad and thick zone of low-resistivity is modeled in the eastern third of the model, which was originally interpreted to represent a thicker accumulation of waste material. Note the similarity of this low-resistivity zone to that observed on dipole-dipole resistivity model for Profile ANL L-2 (Figure 4, middle panel), which places some doubt on interpreting the resistivity models in this manner at this site.

Prior to the field effort, it was noticed that the topography indicated on the Geophex figure appeared to be incorrect based on the available topographic map. This error was later confirmed during the field surveys where the approximate 10-12 ft drop in topography near profile 360X was in actuality a relatively flat, slightly sloping area. It proved necessary to reprocess the original Geophex data using the correct topographic data in order to compare with the ANL resurvey. This reprocessing has the advantage of using the same processing steps for both sets of data, and to contour and display using the exact same color scale and gridding algorithm. Geophex Line 8 (described later) was also reprocessed for the direct comparison with ANL data in the next section.

The model results for the reprocessed Geophex Line 1, and the ANL reoccupation of this profile, are shown in Figure 6. Also shown are the intersections with profiles ANL L-2, Geophex L-8, and ANL L-1 with the interpreted top-of-rock indicated as short horizontal tick marks. A bedrock surface is drawn as a gray-dashed line connecting these tick marks. The reprocessed Geophex Line 1 (top panel, Figure 6) still shows the same general character with a thick zone of low-resistivity in the eastern third of the model, and a decrease in depth below ground surface to the west. The bedrock surface predicted by the cross-line data cuts through the zone of low-resistivity.

The ANL resurvey is shown in the lower panel of Figure 6, and models the bedrock surface as a high-resistivity zone (>400 ohm-m) with a relatively horizontal top at approximately 1860 ft in elevation. There is a slight dip to the west of approximately 15ft over the length of the profile. The top of this high-resistivity zone is in fair agreement with where the intersecting profiles interpreted the top-of-rock.

The discrepancies between the original and resurveyed profile are most likely due to seasonal changes in subsurface moisture content, and on the emplacement quality of the electrodes. For example, the zone of moderate resistivity on the eastern end of the original profile is modeled as a zone of much higher resistivity in the ANL data (likely caused by drier surface conditions during the ANL survey).

Profiles ANL L-1 and Geophex L-8

Both profiles were collected along roughly south-to-north transects, and cross the interpreted eastern end of the waste disposal end. Profile ANL L-1 was collected sub-parallel to Geophex L-8 in order to tie to well 40MW2. Interpretation of the seismic data collected for ANL L-1 is used to guide re-interpretations of Geophex L-8. Thus, the seismic model for ANL L-1, and the resistivity models for Geophex L-8 are shown together in Figure 7.

Profile ANL L-1 was collected using a geophone spacing of 3 ft and two spreads of 48 geophones, and crossed through the eastern end of the identified waste disposal area where the previous resistivity surveys indicated a thicker zone of waste. The seismic model (top panel, Figure 7) images the bedrock surface as a northward sloping horizon, with an increase in depth below ground surface to the north. As for the ANL L-2 interpretation, two highlighted contour lines (gray at 2625 ft/s, and black at 4921 ft/s) are used to indicate the interpreted top of weathered rock and top of bedrock. To the south, the interpreted bedrock surface likely intersects the ground surface where outcrop was observed. Depth to bedrock averages approximately 30 ft below ground surface in the central part of the profile.

The ANL L-1 seismic model predicts a higher bedrock surface at well 40MW2 (1850 ft versus 1840 ft). This discrepancy is probably due to an edge effect in the ANL L-2 model, as geophone coverage for ANL L-2 ends at 40MW2 (geophone coverage on ANL L-1 extends past Well 40MW2).

The original survey along profile Geophex L-8 used a dipole-dipole array geometry and electrodes spaced at 16 ft intervals. Profile endpoints were located during the resurvey using the supplied base map, are probably within 3-to-6 ft of the original profile location. The ANL resurvey used the same electrode spacing and collected both dipole-dipole and

Schlumberger array geometries in order to judge the relative sensitivity of each array type to site conditions.

The reprocessed model constructed from the original Geophex data is shown as the second panel in Figure 7. Also shown are positions of the access road, well 40MW2, and the intersection with Geophex profiles L-1 and L-8. A fair agreement between the resistivity and seismic interpreted bedrock surface is observed in the northern two-thirds of the model section. In this case, the bedrock is modeled as a zone of higher resistivity (>250 ohm-m). High-resistivities (>500 ohm-m) are modeled on the southern end of the profile, and are interpreted to correlate with bedrock that outcrops in this vicinity. A zone of low-resistivity (<20 ohm-m) is modeled between 100-150X, suggesting that the waste reaches upwards of 40 ft in depth at this point. The corresponding seismic depth to rock, however, cuts through this low-resistivity zone.

The third and bottom panels in Figure 7 are the resistivity models constructed from the ANL resurvey. The ANL dipole-dipole model (third panel) suggests that the original low-resistivity zone (<20 ohm-m) is much narrower, and is likely affected by the presence of the road. Within the 100X-to-150X coordinate range, the bedrock surface modeled by the dipole-dipole resurvey agrees closely with where the seismic model (ANL L-1) places bedrock.

The Schlumberger model (bottom panel) has smeared out the near surface low-resistivity zone, creating a broader and deeper feature than is likely present. To the north, both of the resurveyed and original resistivity models are in rough agreement for depth to rock. Note that the thick weathered zone in well 40MW2 is modeled with intermediate to high resistivities (>100 ohm-m).

6. Summary

Geophysical surveys conducted at SWMU 40/71 were able to refine the interpretation of the probable vertical component of waste. The resurvey included two of the original 2D-ERI profiles, and the acquisition of two additional geophysical profiles (a combined 2D-ERI/seismic, and one seismic only). These latter two profiles were tied to existing wells, which allowed for a more accurate correlation with the local geology.

Previous investigations relied primarily on the interpretation of 2D-ERI data, and argued for a relatively thick accumulation of waste material (in excess of 60 ft). These interpretations were based on the presence of broad zones of low-resistivity (<20 ohm-m) thought to be due to the presence of waste. After a review of the resurveyed and new profiles, it is highly probable that clayey zones within the rock, and not waste material, are the source for these low-resistivity features.

Interpretations based solely on the 2D-ERI low-resistivity zones must remain highly tentative unless corroborating information (either borehole or other geophysical methods) support the presence of a topographic bedrock depression. This is due primarily to the ambiguity in interpretation presented by 2D-ERI models.

A test profile, ANL L-2, used a combined seismic and 2D-ERI survey to map the bedrock surface between wells 40MW4 and 40MW2. A zone of low-resistivity imaged by the dipole-dipole model for this line was in stark disagreement with the seismically predicted bedrock surface. The best possible interpretation at this time is that the low-resistivity zone is either an over-extrapolated modeling artifact, and/or represents clayey or low-resistivity zones within the bedrock. The low-resistivity zone cannot be argued as a feature related to buried waste, as this would require a significant excavation and shoring of the underlying bedrock at this locality.

The resurvey of profile Geophex L-1 did not produce the broad zone of low-resistivity on the eastern end of the profile. This is likely due to differences in electrode-ground contact, and on changes in subsurface moisture conditions. The resurvey model appears to be in closer agreement to where the cross-line models predict top-of-rock.

Interpretation of profile Geophex L-8, which includes the sub-parallel ANL L-1, suggests a shallower depth to rock than predicted by the low-resistivity zone on the original profile. The resurveyed 2D-ERI model indicates that this zone is narrower in width, and possibly associated with electrode emplacement problems in the coarse-grained fill material near the access road. The new model indicates a zone of very low-resistivity immediately above the modeled bedrock surface (both 2D-ERI and seismic), which correlates with where the apparent conductivity survey (Geophex, 2001) maps an electrically conductive zone.

Integration of seismic refraction, 2D-ERI and downhole geophysical logging, with the inclusion of existing geotechnical data, has provided an improved understanding of the subsurface conditions under SWMU 40/71. A greater weight can be given to the interpretation in areas where the different geophysical models agree, which is further enhanced by constraining the interpretation based on borehole lithologic and geophysical logging. Co-interpretation of seismic and resistivity methods generated a better perception of the likely vertical thickness of waste, than did the sole analysis of 2D-ERI

data used by previous efforts. In this case, the bedrock surface mapped by the seismic data was in some areas masked by the presence of electrically conductive material on the 2D-ERI profiles. The ability to measure two different physical properties (electrical and acoustic) provides a greater chance to overcome these "masking" effects.

The Radford specific standard operating procedure for geophysical surveys (SOP 20.7) needs revision to include two-dimensional electrical-resistivity imaging (2D-ERI) and seismic refraction profiling. RFAAP SOP 20.7 does cover vertical electrical sounding (1D modeling) and horizontal electrical-resistivity profiling, however, these techniques are currently used less frequently than the more powerful 2D-ERI method. In light of this deficiency in SOP 20.7, we suggest updating the resistivity section two include 2D-ERI methodologies, and adding a section that covers seismic refraction and vertical seismic profiling. These new sections should incorporate relevant information found in the ASTM documents, the USACE (1995), and take advantage of lessons learned from the previous geophysical surveys (Geophex, 2001; ANL 2003).

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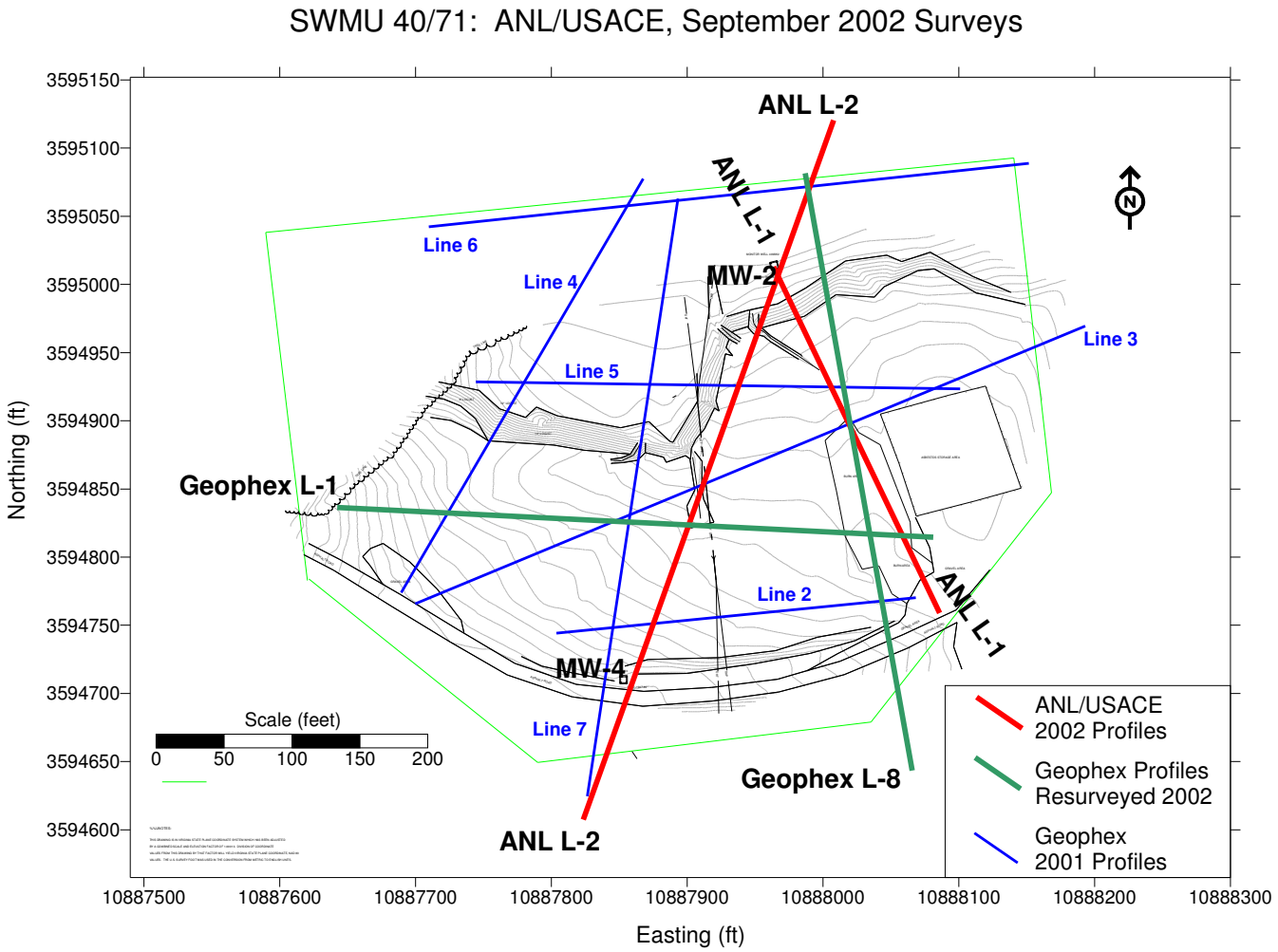

Figure 1. Base map for SWMU 40/71

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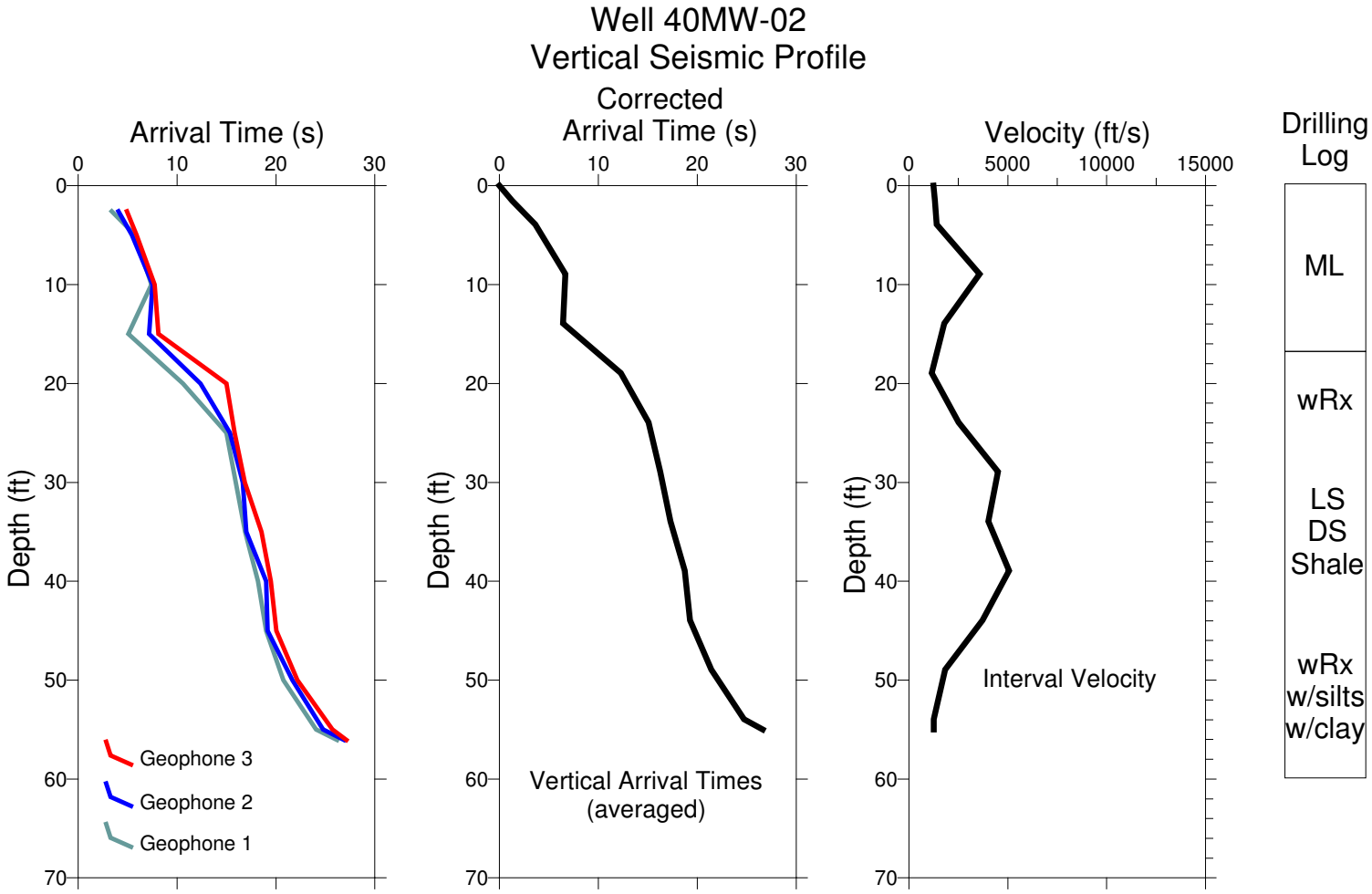

Figure 2. Borehole Velocity Log, Well 40MW2

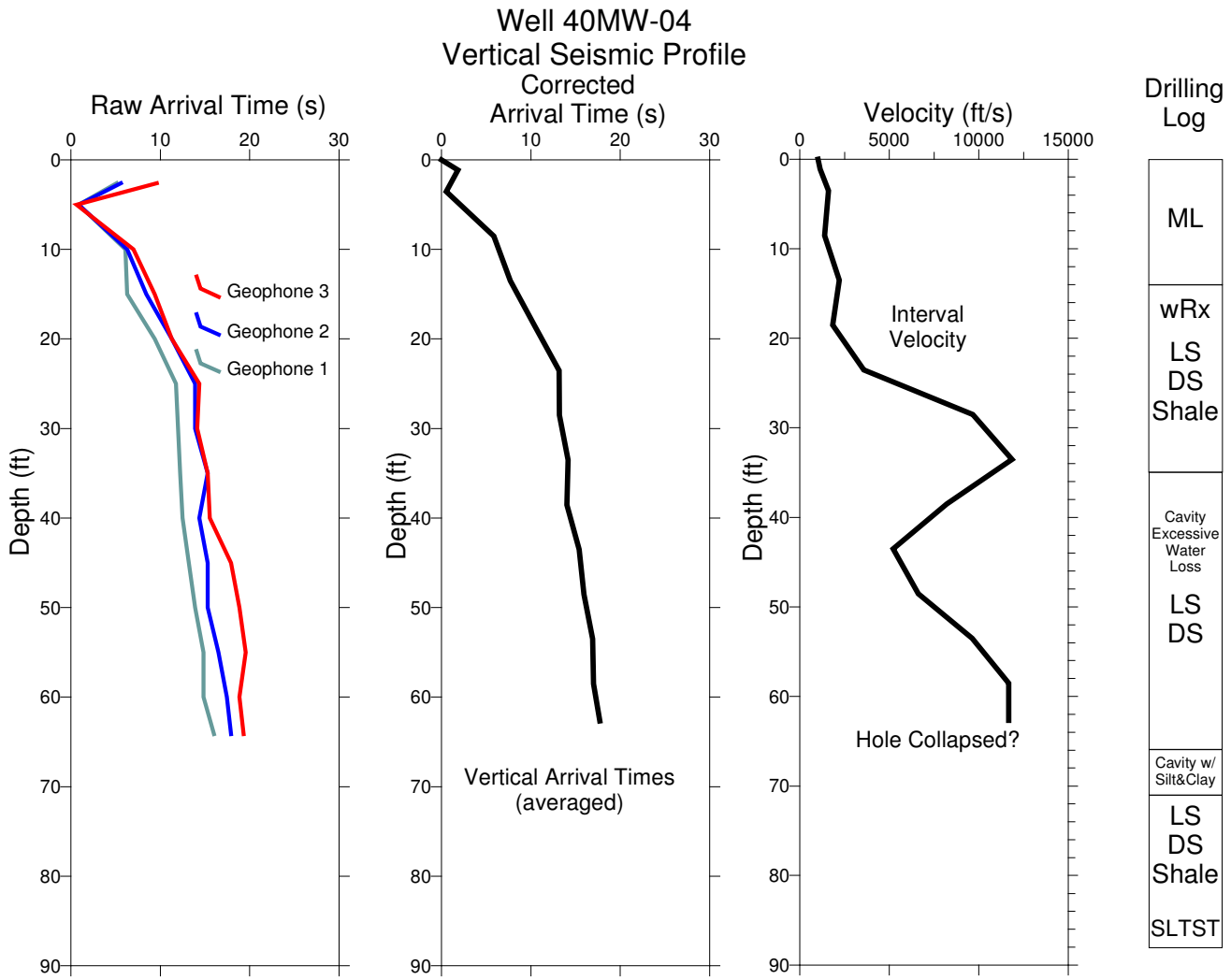

Figure 3. Borehole Velocity Log, Well 40MW4

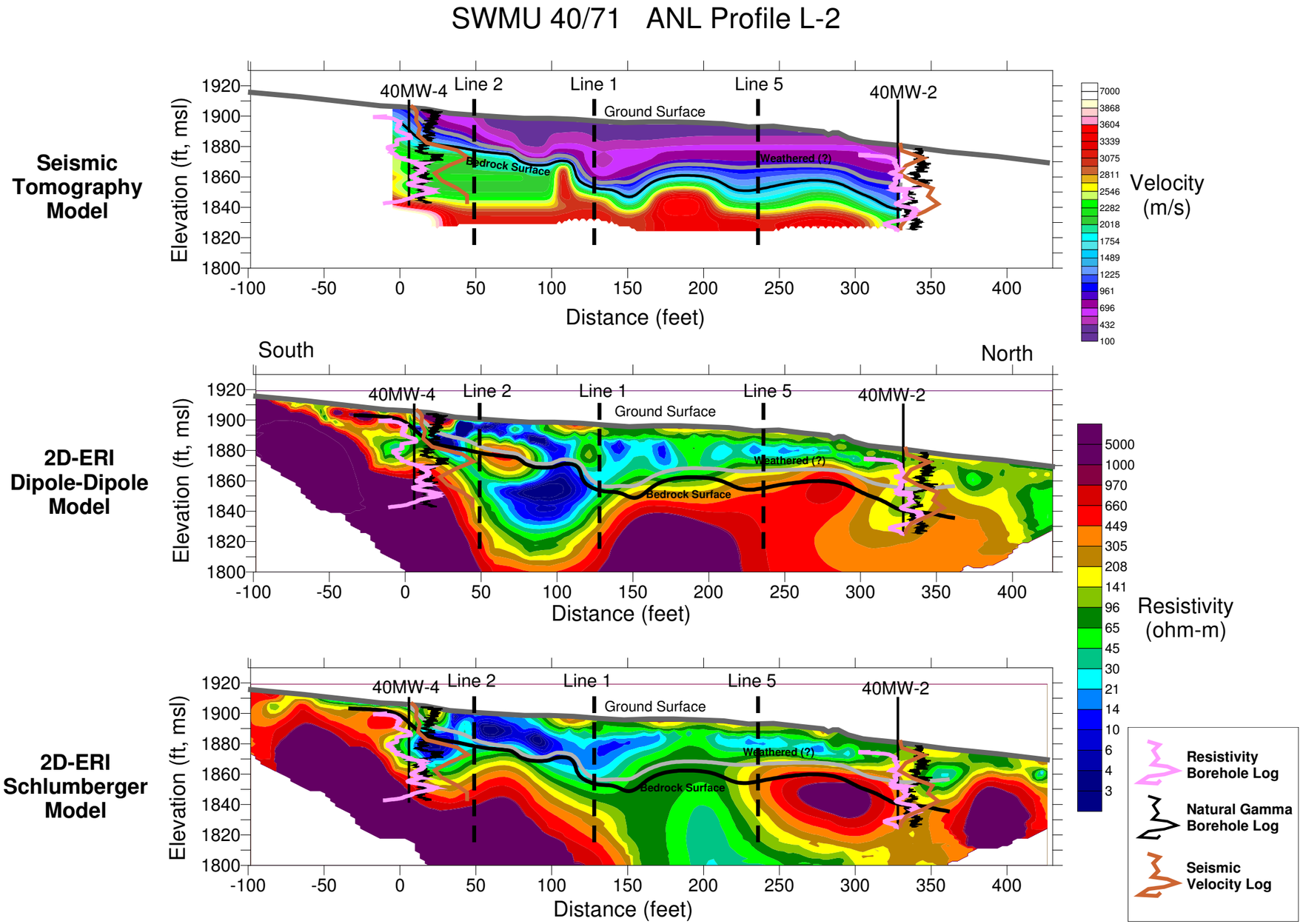

Figure 4. Geophysical results for Profile ANL L-2

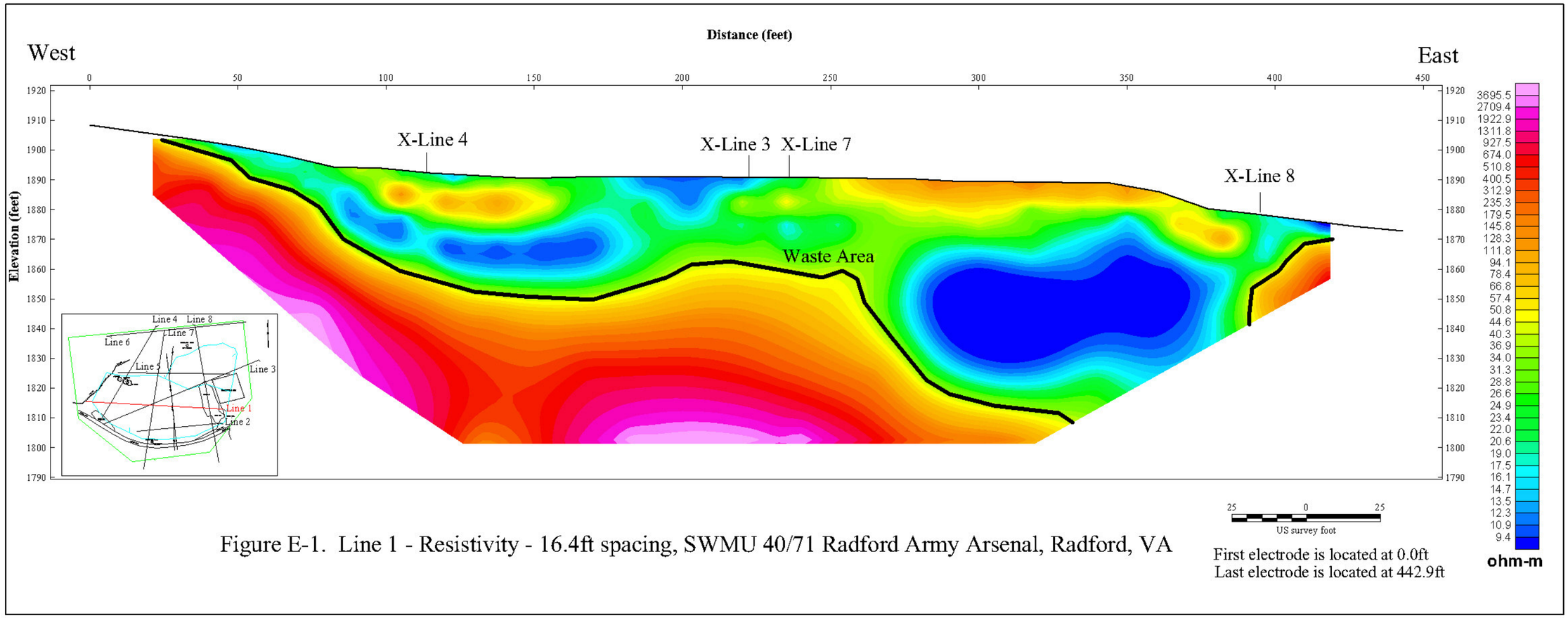

Figure E-1. Line 1 - Resistivity - 16.4ft spacing, SWMU 40/71 Radford Army Arsenal, Radford, VA

Figure 5. Original Model, Profile Geophex L-1

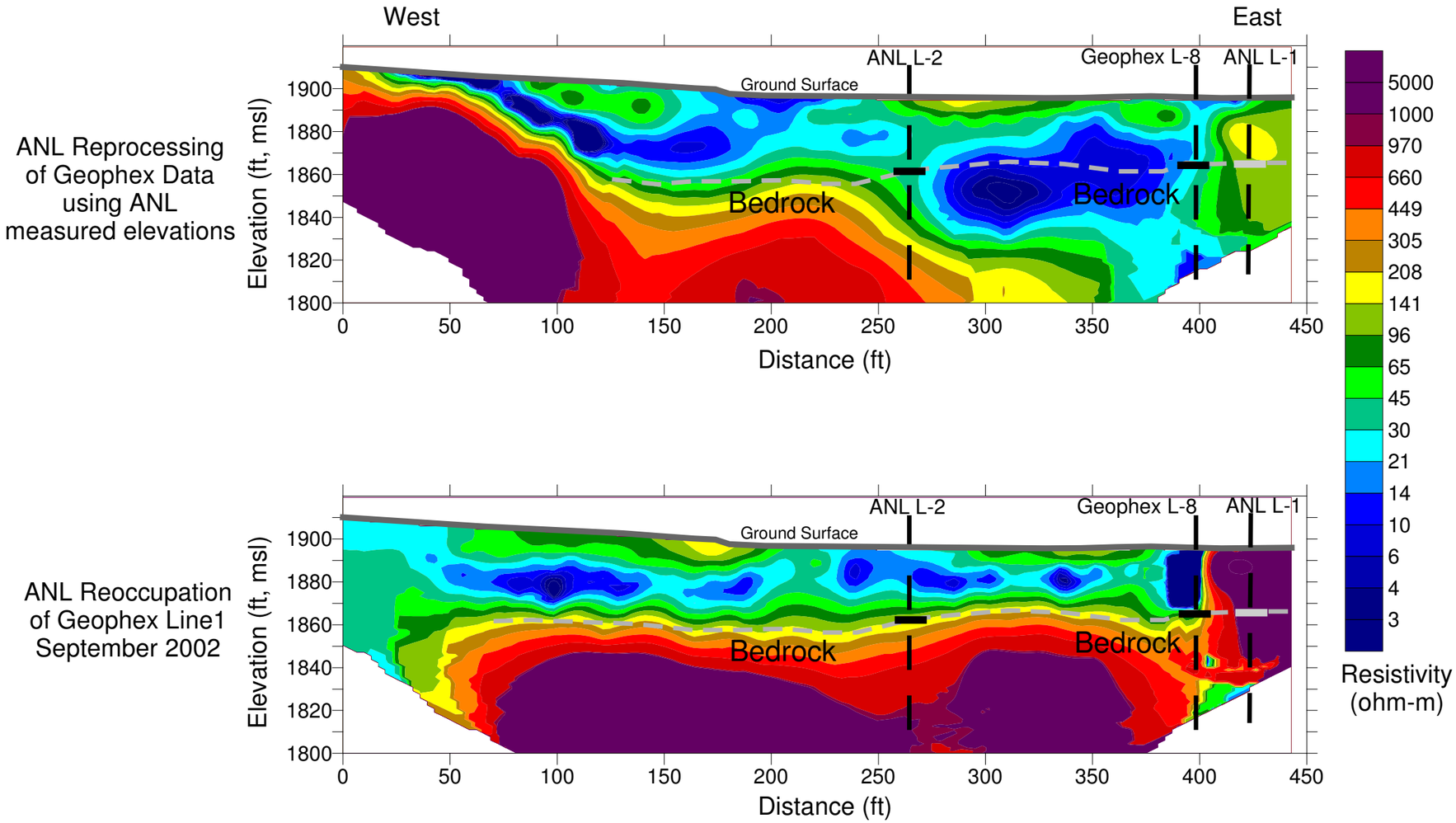

Figure 6. Geophysical results for Profile Geophex L-1

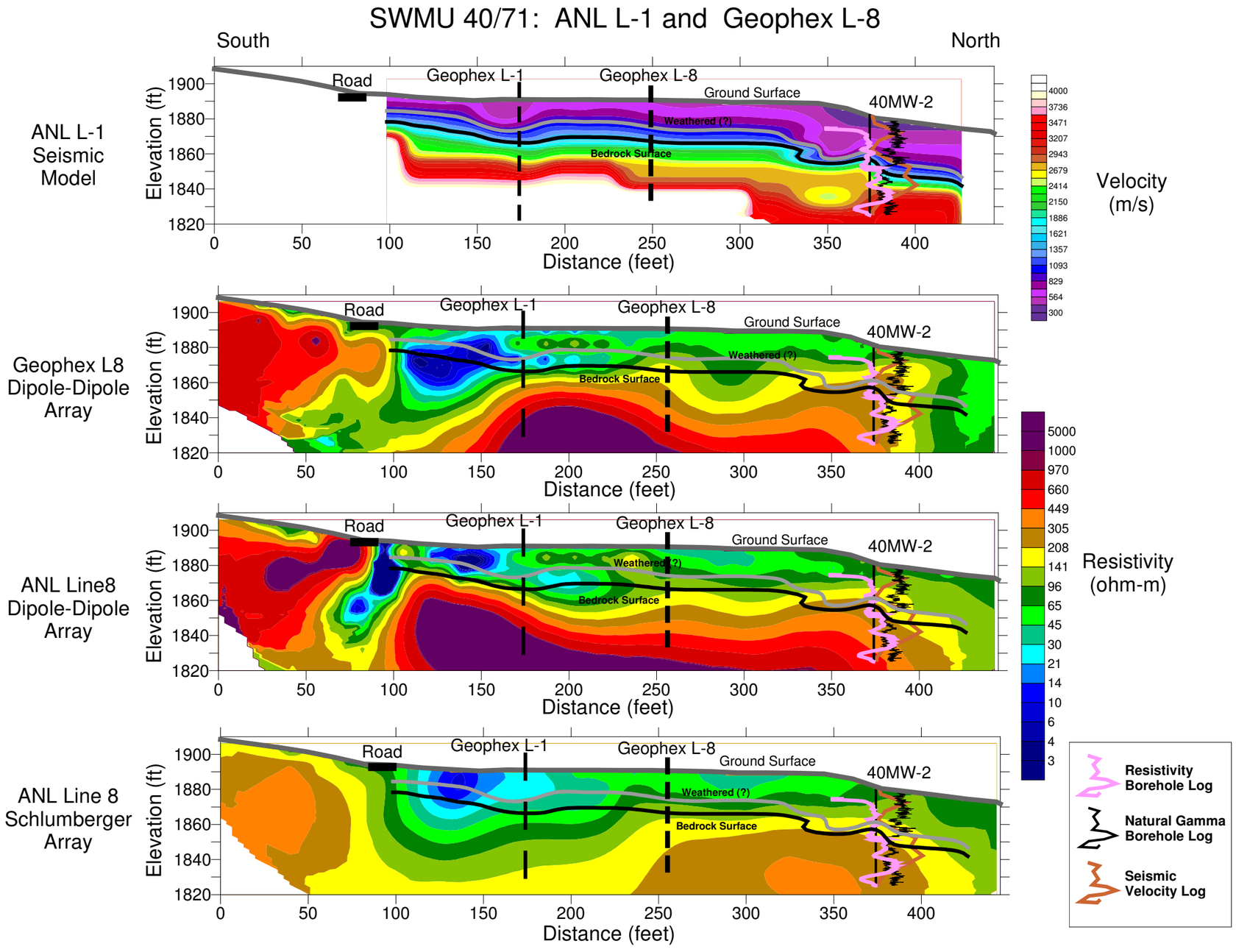

Figure 7. Geophysical results for Profile ANL L-1 and Geophex L-8

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APPENDIX D.3

SWMU 40 (NITRO LANDFILL) GEOPHYSICAL REPORT
URS, MARCH 2007

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RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Solid Waste Management Unit 40
(Nitro Landfill)
Geophysical Investigation Report

DRAFT
MARCH 2007

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ARCHITECT-ENGINEER SERVICES
CONTRACT NO. DACA31-00-0011
DELIVERY ORDER NO. 0046

SOLID WASTE MANAGEMENT UNIT 40 (NITRO LANDFILL)
GEOPHYSICAL INVESTIGATION REPORT
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Appendix A Draft 2004 RFI Assessment of Subsurface Conditions
Appendix B ATS International Resistivity Imaging Survey Report

LIST OF ABBREVIATIONS AND ACRONYMS

º .....Degree
2D-ERI.....Two-Dimensional Electrical Resistivity Imaging
ATS.....ATS International
bgs.....Below Ground Surface
EPIC.....Environmental Photographic Interpretation Center
ERI.....Electrical Resistivity Imaging
ft.....Feet
MMA .....Main Manufacturing Area
PCB.....Polychlorinated Biphenyl
RFAAP.....Radford Army Ammunition Plant
RCRA.....Resource Conservation and Recovery Act
RFA.....RCRA Facility Assessment
RFI .....RCRA Facility Investigation
SWMU.....Solid Waste Management Unit
USEPA.....United States Environmental Protection Agency
VDEQ .....Virginia Department of Environmental Quality
VI .....Verification Investigation

1.0 INTRODUCTION

1.1 SITE DESCRIPTION

Solid Waste Management Unit 40 (SWMU 40) is an inactive landfill (also known as the Nitro landfill) located in south-central portion of the Main Manufacturing Area (MMA) at Radford Army Ammunition Plant (RFAAP), Radford, Virginia (Figure 1). The landfill was not permitted and received paper, office trash, concrete, and rubber tires during the 1970s and early 1980s. Operations ceased and the unit was closed with a clay cap and grass cover. In approximately 1991, an asbestos container storage area was constructed immediately northeast of the landfill area. This area is fenced enclosed gravel covered area that contains a covered roll off container box used to temporary store asbestos containing material in double bags. Figure 2 shows the site layout.

The site is located at an elevation of approximately 1,880 to 1,900 feet (ft) above mean sea level in an upland area characterized by gently to steeply sloping ridges, the presence of landforms indicative of karst topography (e.g., sinkholes) and a general downward slope toward the northwest. The site is topographically lower than areas to the east, south, and west, and topographically higher than areas to the north (Figure 1).

Dense maintained grass covers the site. The land slopes gently to the northeast. The southeastern portion of the area is 4 to 5 ft below the grade of a generally east-west bearing paved road, whereas the southwestern portion of the site is generally level adjacent to this road. The western portion of the site is roughly coincident with a tree line. The northern boundary of the site is characterized by a distinct 10-ft scarp running generally east west and the eastern boundary is roughly coincident with the fenced asbestos storage area and is further defined by a paved road. SWMU 71, the Flash Burn Area, is located on the southwestern corner is identified by a small area surfaced with gravel.

1.2 SITE BACKGROUND AND PREVIOUS INVESTIGATIONS

The Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) conducted by the U.S. Environmental Protection Agency (USEPA) in 1987 identified the site as having the potential to release contaminants into the environment (USEPA, 1987).

In 1992, the Environmental Photographic Interpretation Center (EPIC) under the direction of USEPA performed an assessment of multiple SWMUs at RFAAP using selected aerial photographs taken from 1937 to 1986. The study identified features representing a potential groundwater or surface water contamination sources (USEPA, 1992). Activity was first noted at SWMU 40 in a 1971 photograph and was reportedly ongoing through a 1986 photograph. The 1971 photograph reportedly indicated significant filling with three phases interpreted in the site area (USEPA 1992). The 1986 photograph indicated most of the site was re-vegetated with the exception of the northeast corner where recent filling was visible. SWMU 71 activity was first noted in the 1986 photograph. A photo-geologic interpretation was also performed as part of the EPIC study to identify solution features such as fractures and sinkholes south of the south central MMA.

Dames & Moore conducted a Verification Investigation (VI) at the site in 1991 and 1992. Four borings were completed around SWMU 40 to a depth of 49 to 162 ft below ground surface (bgs) for planned monitoring well installations. Groundwater was not encountered during drilling or in the subsequent measurements collected from borings 40MW2 and 40MW4. Bedrock encountered in the borings consisted of argillaceous limestone and dolomite with abundant clay zones. Numerous zones of intense weathering and fracturing were encountered in the borings.

Prior to development of a RCRA Facility Investigation (RFI) work plan for SWMU 40, surface and subsurface geophysical investigations were conducted by Geophex Services, Ltd (Geophex, 2001) and Argonne National Laboratory in 2001 and 2002 (ANL, 2003), respectively. Surface geophysical surveys completed included magnetic, electromagnetic, two-dimensional electrical resistivity imaging (2D-ERI), and seismic refraction tomography. Downhole electrical resistivity logging was conducted in borings

40MW2 and 40MW4 along with borehole velocity measurements for the seismic study. The geophysical surveys focused on delineating the lateral and vertical extent of waste and characterizing shallow subsurface conditions below the landfill.

A RCRA Facility Investigation (RFI) is currently being conducted at the site by URS (URS, 2004). A draft report was submitted to the USEPA and the Virginia Department of Environmental Quality (VDEQ) in December 2004 and based on comments received additional investigations will be conducted at SWMU 40 and adjacent SWMU 71 to fill identified data gaps, including:

- Further characterizing the nature and extent of polychlorinated biphenyls (PCBs) in soil north of the landfill area;
- Investigation of the groundwater migration pathway and characterization of groundwater conditions and quality in the immediate landfill area; and
- Further characterizing the nature and extent of metals and PCBs in soil at SWMU 71.

Appendix C.1 of the Draft 2004 RFI provided an in-depth discussion of site geologic and hydrogeologic conditions. It focused on the extent of the landfill material and presents results of the soil boring and test pit sampling program. A detailed comparative analysis of the various geophysical investigations was also completed. For brevity, the information is not re-presented herein but included as Appendix A. This portion of the RFI study concluded that the landfill was originally cited within a sinkhole, which can be observed in the Radford North USGS 7.5-Minute Topographic Quadrangle. Based on the soil boring and test pit sampling program, depth to bedrock interpretations were also developed and presented.

The site is underlain by the Cambrian age Elbrook Formation. The Elbrook Formation is comprised of laminated to thick-bedded dolomite, thin- to medium-bedded limestone, and dolomitic platy shale and siltstone. The average strike and dip of bedrock in the vicinity of the site is approximately 110°/26° to the southwest (URS, 2004).

Bedrock in the vicinity of SWMU 40 is highly karstified with numerous large sinkholes present. A dye-trace study completed by Parsons Engineering Science, Inc. (Parsons) (ES, 1994; Parsons, 1996) indicated that a stream which sinks approximately 200 ft east of SWMU 40 flows westward to a spring on the New River. The spring was named Parsons Spring 3. The dye traveled a distance of 4,800 ft in approximately 24 hours, indicating the presence of an open-flow karst conduit beneath or in the immediate vicinity of SWMU 40.

1.3 TASK OBJECTIVES

The objectives of this geophysical investigation at SWMU 40 are to use 2D-ERI to:

- Evaluate local bedrock structures influencing groundwater flow and potential leachate migration from the landfill waste area; and
- Identify optimal monitoring well locations and depth intervals for monitoring to intercept any potential leachate plume and to detect releases of hazardous constituents to groundwater.

2.0 INVESTIGATION METHODOLOGY

A 2D-ERI survey was conducted by ATS International (ATS), Christiansburg, Virginia under contract to URS on December 11 and 12, 2006. Survey equipment included a Tigre® 64 resistivity system manufactured by Allied Associates, Ltd in Great Britain. Data from two resistivity lines were collected at the site. Electrode spacing for each resistivity line was 5 meters (16.4 ft), and data was collected using the dipole-dipole and pole-dipole arrays with measurements to n=64. Line 1 was placed trending east to west on the north side of SMWU 40. Line 2 was placed trending north to south on the west side of the landfill area. These orientations were intended to provide optimum imaging of karst features and geologic structures at depth in the vicinity of the site, and intercept the anticipated hydraulic gradient to the north and/or west towards the New River. Figure 2 illustrates the resistivity line locations.

Resistivity measurements are collected by applying an electric current into the ground via two electrodes, and simultaneously measuring the potential at two other electrodes with a multi-meter. The dipole-dipole array provides data of significantly higher resolution than the pole-dipole array, while the pole-dipole array provides data to a greater depth. For the dipole-dipole array, a current is applied between two electrodes (current dipole) positioned a predetermined distance apart. The voltage across two other electrodes (potential dipole) is measured simultaneously with the applied current. In the pole-dipole array, an additional electrode (the remote electrode) is placed a large distance from the line of electrodes. A current is applied between the remote electrode and one within the main line of electrodes. The voltage is measured across two other electrodes in the main line of electrodes. The meter was connected via a multi-conductor cable to electrodes placed in the ground. Measurements were initiated at one end of the line and incrementally moved through the electrodes until readings had been taken at every position along the line. The value of n was then increased to add additional resistivity readings at greater depths in the subsurface. The apparent resistivity measurements collected in the field were corrected using the RES2DINV inversion modeling software (see Appendix B).

Electrode locations were flagged and marked in the field and labeled with a unique identifier for future reference. Where satellite coverage was available out of the tree line, the location of each electrode location was surveyed by URS using a Trimble global positioning system (GPS) unit.

The survey was modified from the approved work plan based on field conditions. A two-phased approach was to be used for the survey, varying the electrode spacing and length of lines. Both phases would use a dipole-dipole array. The first phase was to use two short lines in the vicinity of the landfill using an electrode spacing of 10 meters. A second longer set of resistivity lines would then be placed with electrodes at 5 meter intervals to provide high-resolution images of areas identified in the low-resolution lines. In a practical sense, the site has limited space to increase the lines along the intended orientation. Line 2 also had to be moved just west from the proposed location to maintain a straight line orientation around the fenced metals and drum storage area. It was decided to place a single set of high resolution lines with electrodes spaced at 5 meters, and to extend the lines to the maximum length the site would reasonably allow. This also had the advantage of reducing the survey time by removing the step of removal and repositioning electrodes from the low to high resolution configuration. The additional desired depth imaging was then acquired with a second pole-dipole array. Task objectives were obtained using both the dipole-dipole and pole-dipole electrode arrangements for both lines placed at maximum length. The 2D-ERI survey procedures used were consistent with the RFAAP Master Work Plan Standard Operating Procedure 20.7 (URS 2003).

3.0 INVESTIGATION RESULTS

This section summarizes the results of the resistivity survey. The dipole-dipole pseudo-section images for lines 1 and 2 are presented as Figure 3. For a more detailed presentation of results, the reader is referred to Section 4 of the ATS report (Appendix B).

A shallow zone of low resistivity indicative of landfill materials is observed between electrodes 1-32 and 1-56 (Figure 3). Two zones of abnormally low resistivity values (less than 20 Ohm-meters) are also observed in the central portion of the line below the landfill materials. The shallower of these two anomalies occurs at a depth of approximately 60 feet, and is located beneath the area between electrodes 1-32 and 1-35. The deeper anomaly occurs at a depth of approximately 100 feet, and is located beneath the area between electrodes 1-39 and 1-43. Both zones are likely karst features or fracture zones. Their location and the unusually low resistivity values may also suggest the presence of contamination (leachate) associated with the former disposal area. It is reasonable to interpret that one or both of the anomalies in that portion of Line 1 likely represents karst solutional features related to the known buried sinkhole. This interpretation is supported by previous soil boring investigations conducted by URS in 2004 (see Appendix A), and the known sinkhole feature observed on the USGS topographic map of the site which was prepared prior to placement of fill material.

In the western portion of Line 1, numerous small, relatively shallow low-resistivity features are observed which likely represent soil-filled karst features. These features are at a higher elevation than SWMU-40/71, and therefore would not be suitable locations for the placement of monitoring wells. However, a vertically extensive low-resistivity zone is observed beneath electrodes 1-17 to 1-20 which may represent a fracture zone or a larger and deeper karst feature. The central part of this feature is approximately 100 feet below grade and approximately 60 to 70 feet lower than the buried fill materials in SWMU-40.

The results for Line 2 reveal the complex and highly varied nature of the subsurface beneath the site, bearing characteristics typical of highly fractured and highly karstified terrain (Figure3). Numerous anomalies are observed in the section for Line 2, with possible fracture zones identified beneath the vicinities of electrodes 2-13, 2-23, and 2-48 and possible karst features identified beneath electrodes 2-13, 2-38 and 2-48. The interpreted karst feature beneath electrode 2-38 is at an approximate elevation of 1,830 feet, consistent with the elevation of the anomaly previously described beneath electrode 1-18, and also bears the characteristics of a partially soil- or water-filled karst feature. Due to the similarities in elevation and character of these two anomalies, it is possible that they represent a continuation of a karst conduit between those two locations.

As with the pole-dipole dataset for Line 1, the pole-dipole section for Line 2 revealed similar characteristics as the dipole-dipole data, but provided greater depth.

4.0 DISCUSSION OF GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

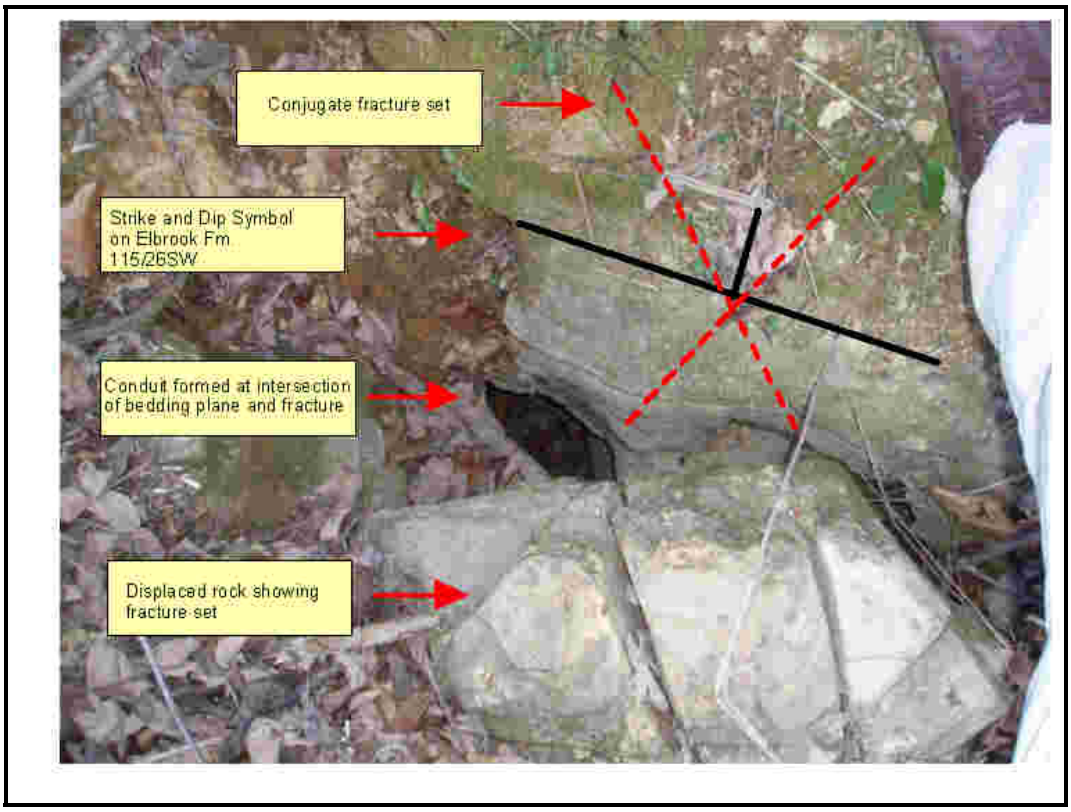
Investigation results identify several low resistivity anomalies that appear to be favorable for monitoring well placement in the immediate vicinity of the landfill. However, a number of considerations must be taken into account to determine optimal well locations, including:

1. The highly variable nature of subsurface conditions and the difficulty in placing wells to intercept preferential groundwater flowpaths developed in karst terrane.
2. Dye from injection point INJ1 at SWMU 17 traveled a minimum straight line distance of 4,800 feet in a day to S136 (Parsons 3 Spring), thus demonstrating the existence of a groundwater conduit(s) beneath the site. The direction of travel appears to be along the predominant average strike of bedrock bedding planes (110°) in the vicinity of the site. Figure 4 provides a close-up of Figure 3-7 prepared by Shaw Environmental, Inc. in the 2005 current conditions report (Shaw, 2005). It illustrates the dye travel path along with various photo-lineament, structural features and sinkhole location interpretations.
3. The Parsons 3 Spring and other springs are located within or in close proximity to the Max Meadows Tectonic Breccia, which outcrops at this location along the New River. The breccia occurs within the fault zone at the base of the Elbrook Formation. The fault in this area is a refolded splay fault structurally above the main décollement for the Pulaski Fault (Schultz, 1986).
4. Low resistivity zones and resistivity contrasts identified at depth at the site can reasonably be assumed to be water saturated karst features indicative of preferential pathways for groundwater flow.

Since geologic and hydrogeologic conditions control groundwater flowpaths, optimal placement of wells is dependent on development of an accurate working hypothesis for selection of well locations and depths.

Results of studies in the Shenandoah Valley indicate caves in the Cambro-Ordovician limestones and dolomites form along the intersections of bedding planes and joints (Harlow et al., 2005; Orndorff and Harlow, 2002). Cave conduits in general form along bedding planes, joints and faults or at the intersection of any two of these (Worthington, 2001). Additionally, sinkholes (and conduits) may preferentially develop along bedding strike with more rapid dissolution of lithologically less resistant rock. This preferential development is more readily expressed as bedding is folded and exposed to weathering. The annotated photograph on the following page illustrates some of these features of sinkhole and conduit formation in the vicinity of SWMU 40.

Conduits typically organize into a structurally controlled dendritic network feeding larger second and third order conduits that outfall to large springs (Worthington, 2001). As the distance from the spring to the perimeter of the recharge area increases, the deeper the groundwater flow, and the larger the spring. Studies in Virginia have shown that even at depths of 100 meters or more, large scale thrust faults in Virginia can be high transmissivity fault zone aquifers (Seaton and Burbey, 2005). These and the other considerations noted above suggest that the groundwater flow underneath SMWU 40 feeding the Parsons 3 Spring area is relatively deep and fed by a conduit(s) developed within or in close proximity to the Pulaski Thrust Fault at the base of the Elbrook Formation. The larger conduit(s) is fed by smaller structurally controlled conduits formed along the intersections of bedding planes and fractures or joints. It is within this context results of the resistivity survey are evaluated and the suitability of low resistivity anomalies assessed as optimal target locations for monitoring wells.



Photograph taken at the bottom of the sinkhole at resistivity line 2, electrode 46. The sinkhole location is noted on Figure 3.

5.0 CONCLUSIONS AND RECOMMENDED MONITORING WELL LOCATIONS

The positive dye trace conducted from the sinkhole at SWMU 17 indicates that an open-flow karst conduit exists beneath or in close proximity to SWMU 40. This information combined with the understanding that SWMU 40 was constructed above a sinkhole suggests groundwater migration from the vicinity of SWMU 40 is likely to be primarily to the west, generally along strike, and primarily through relatively well-developed karst conduits. The resistivity data collected to the north and to the west of SWMU 40 shows bedrock beneath the site is characterized by numerous low-resistivity anomalies which are consistent with bedrock fracture or fault zones and karst-related dissolution features.

A total of seven resistivity anomalies were identified and interpreted by ATS as fracture zones and/or karst features. Two zones of very low resistivity values are observed in the central portion of Line 1 and are interpreted as karst features or fracture zones. The anomalously low resistivity values at these locations may also indicate the presence of contamination associated with the former disposal area. Numerous anomalies are also observed in the section for Line 2, with ATS interpreting possible fracture zones beneath electrodes 2-13, 2-23, and 2-48 and possible karst features identified beneath electrodes 2-13, 2-38 and 2-48. Each of these areas are possible target locations for installation of monitoring wells.

URS recommends placement of two groundwater monitoring wells based on site geologic and hydrogeologic conditions, and the recommendations provided by ATS. Monitoring well 40MW5 is recommended to be placed at electrode 1-34. Monitoring well 40MW6 is recommended to be placed at or in the immediate vicinity of electrode 41. Wells placed at these locations would target the very low resistivity anomalies observed beneath the northern margin of the landfill area, and would likely intercept karst drainage from the probable sinkhole buried beneath SWMU 40. Well 40MW5 and 40MW6 should be completed to minimum depths of 75 and 130 feet, respectively. Figure 5 illustrates the well locations along with other wells in the vicinity of SWMU 40 that would be used during groundwater sampling at the area.

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FIGURES

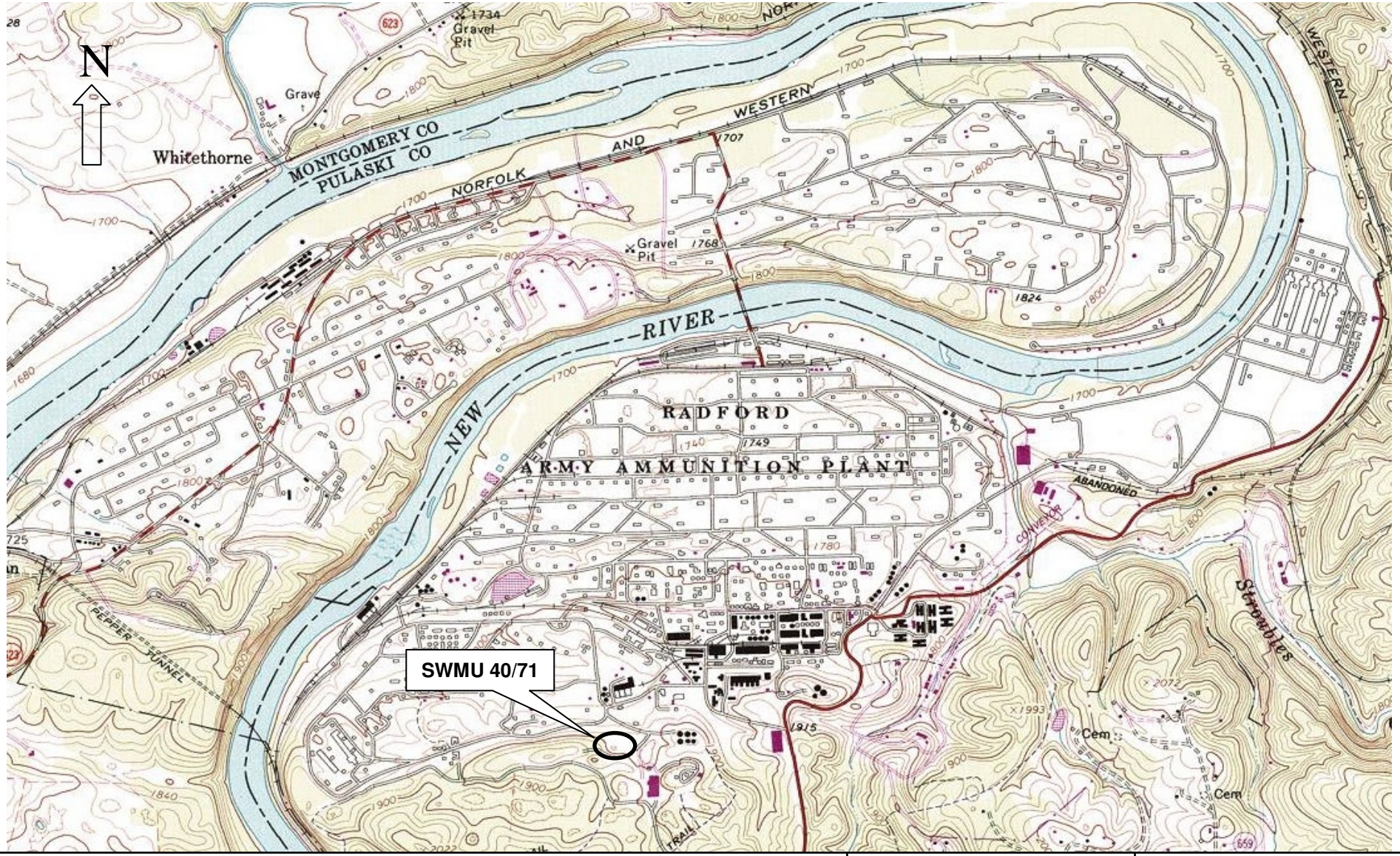


FIGURE 1

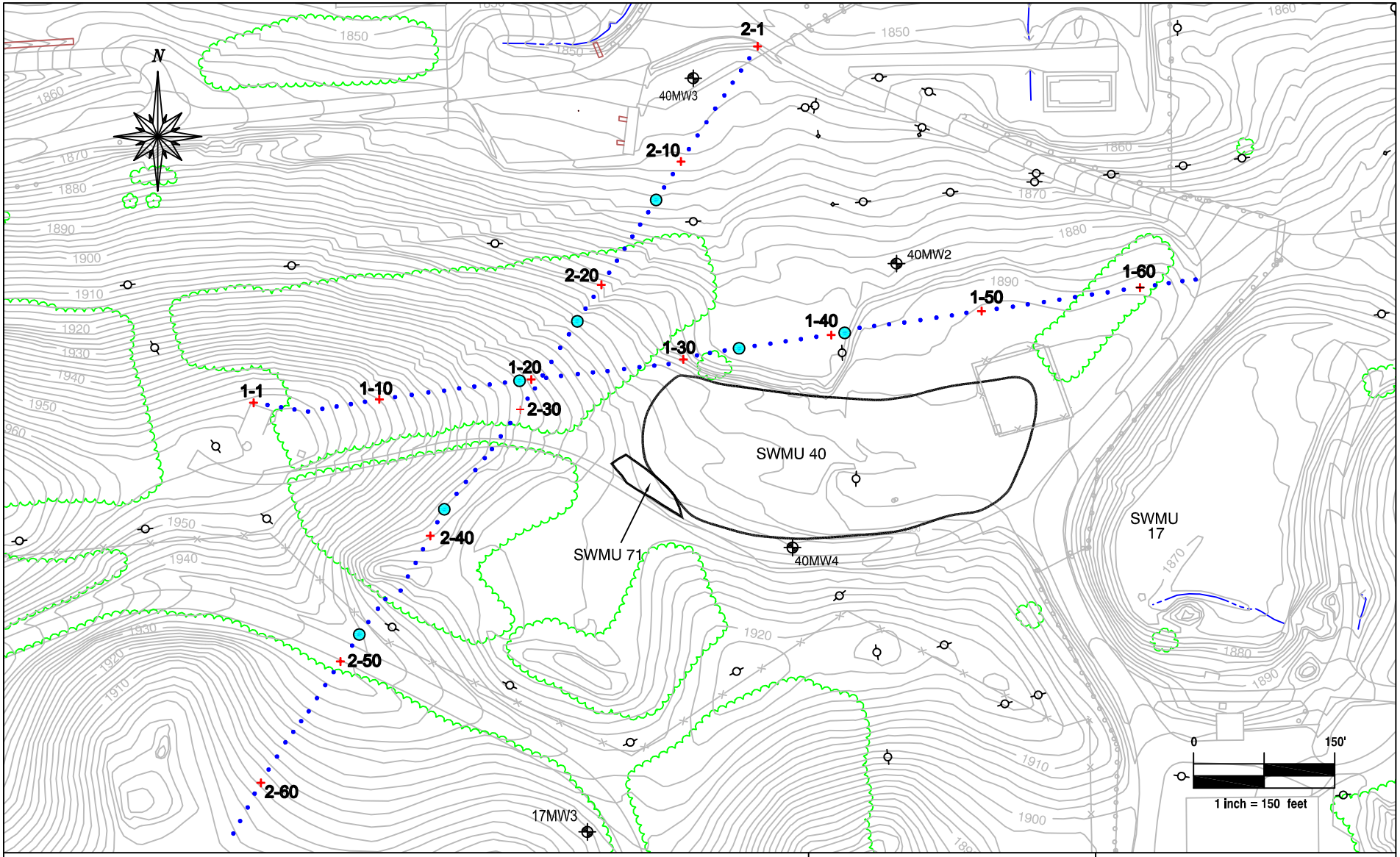
Site Location Map

Date: January 2007	URS Project #: 21354880
Prepared by: DBC	Approved by: JOS
Scale: *1" = 2000'*	File Name: Figure 1 Site Loc

SWMU 40/71

RCRA Facility Investigation
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
540 Falmouth Street
Suite 201
Richmond, Virginia 23230



Legend

- SWMU Boundary
- Existing Monitoring Well
- 1-10 Geophysical Resistivity Stations
- Topographic Contour
- Favorable Drilling Target for Proposed Monitoring Well
- Overhead Electric Pole

FIGURE 2

Site Layout with
Geophysical Resistivity Lines

Date: January 2007	URS Project #: 21354880
Prepared by: DBC	Approved by: JOS
Scale: 1 inch = 150 feet	File Name: Fig.2

SWMU 40/71

RCRA Facility Investigation
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230

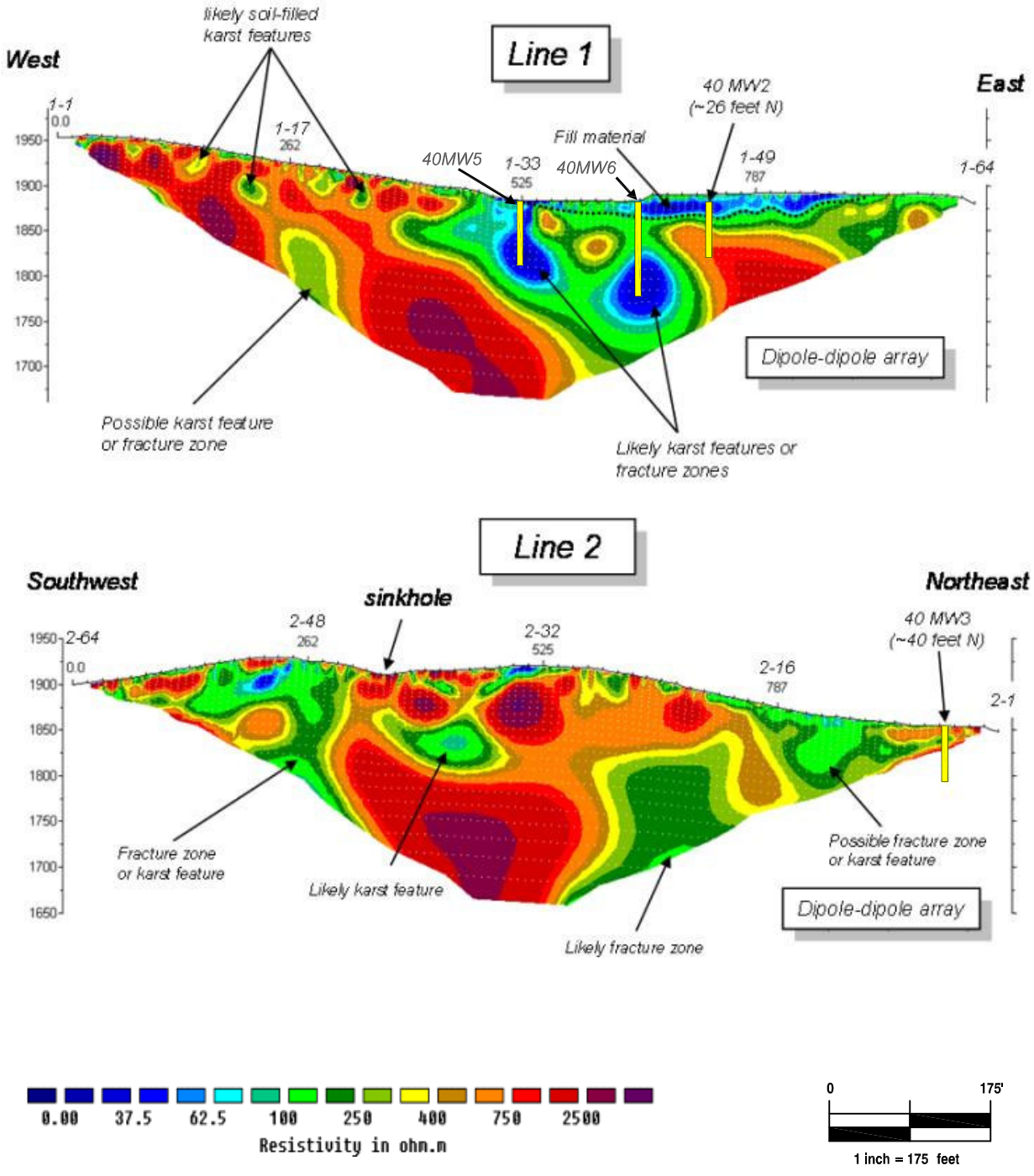
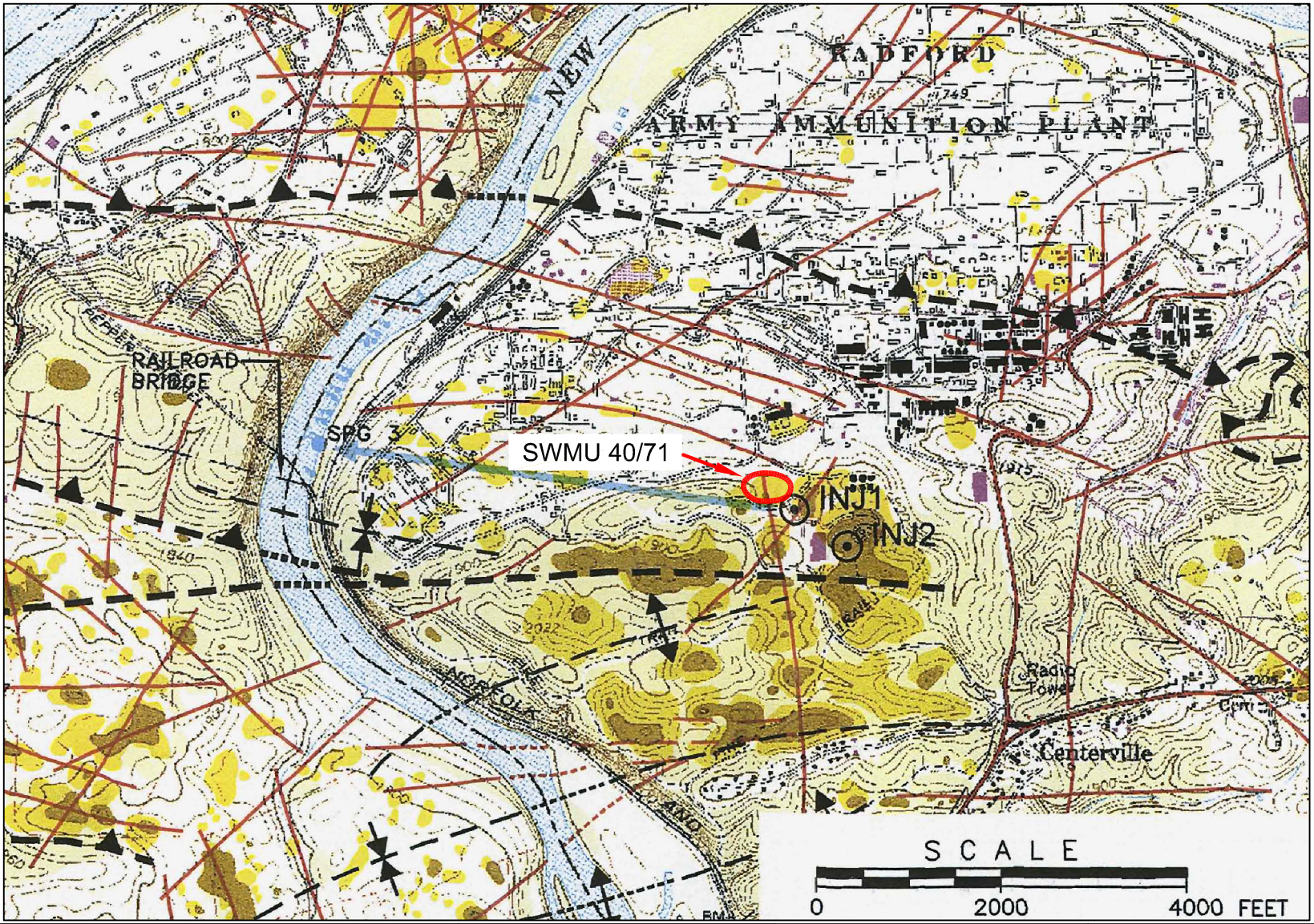


	FIGURE 3 Annotated Dipole-Dipole Resistivity Psuedo-Sections	**SWMU 40/71** RCRA Facility Investigation Radford Army Ammunition Plant Radford, Virginia
	Date: February 2007 / URS Project #: 21354880	
	Prepared by: DBC / Approved by: JOS	URS Group, Inc. 5540 Falmouth Street Suite 201 Richmond, Virginia 23230
	Scale: 1 inch = 175 feet / File Name: Fig. 3 Annot.DD Res	



LEGEND:

- PHOTOLINEAMENTS
- USGS SINKHOLES
- ENGINEERING SCIENCE INC. SINKHOLES
- INJ2 DYE INJECTIONS
- SPG 3 SPRING
- DYE TRACE FLOW DIRECTION

STRUCTURES:

- PULASKI THRUST FAULT SPLAY
- ANTIFORM
- SYNFORM

Source: Current Conditions Report, Shaw, 2005

N

FIGURE 4

Interpreted Photo - Lineaments, Sinkholes and Dye Trace Results

Date: January 2007	URS Project #: 21354880
Prepared by: DBC	Approved by: JOS
Scale: As Shown	File Name: Fig.2

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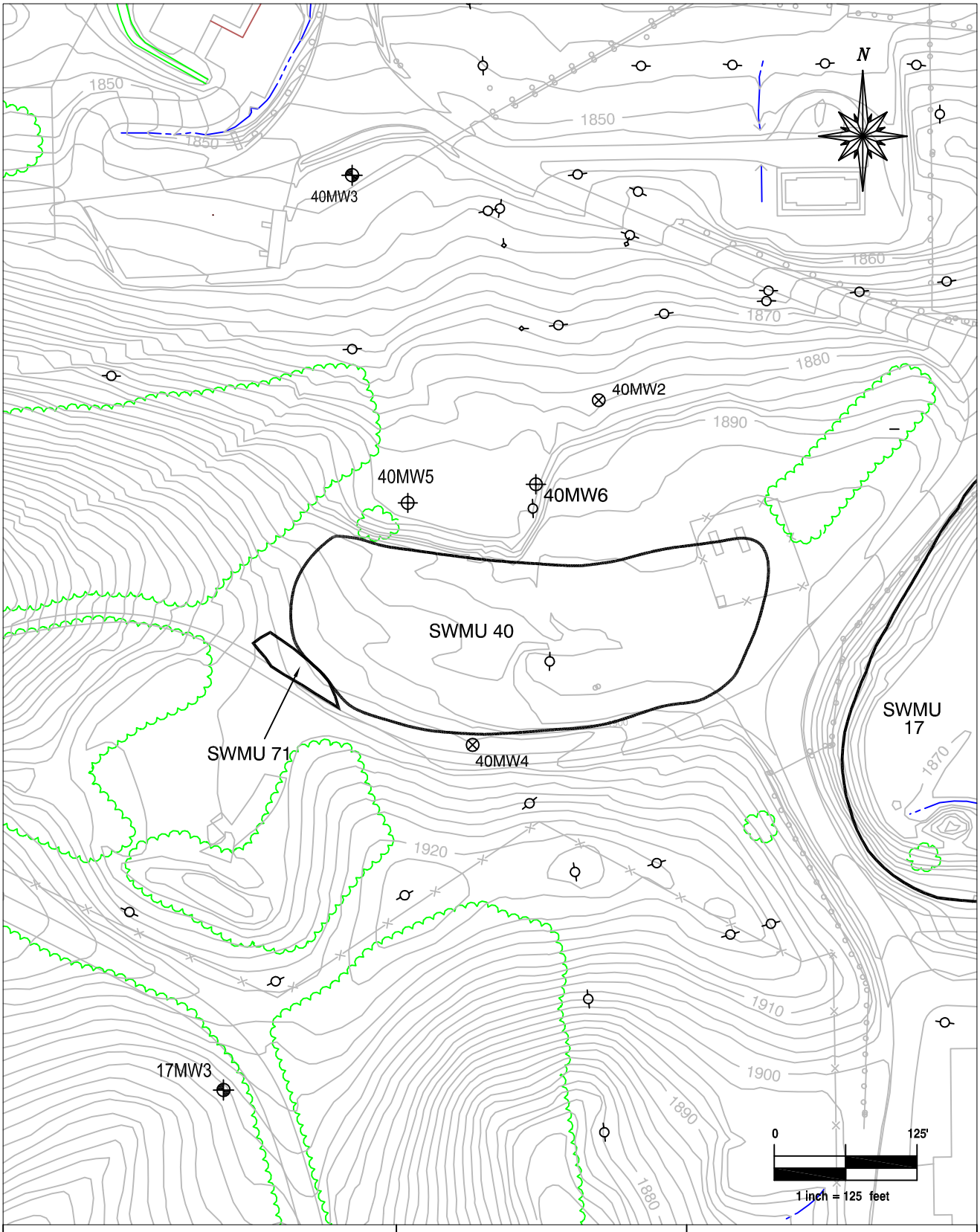

Legend

- SWMU Boundary
- Existing Monitoring Well
- Proposed Monitoring Well Location
- Previous Bedrock Boring Location
- Overhead Electric Pole

FIGURE 5

Proposed Monitoring Well Locations

Date: February 2007	URS Project #: 21354880
Prepared by: DBC	Approved by: JOS
Scale: 1 inch = 125 feet	File Name: Fig. 3 Prop. Well Loc.

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Radford, Virginia

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APPENDIX A

DRAFT RFI ASSESSMENT OF SUBSURFACE CONDITIONS
(APPENDIX C.1 – DRAFT RFI REPORT)

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C.0 ASSESSMENT OF SUBSURFACE CONDITIONS

A description of the regional soil, geology, and hydrogeology at RFAAP is presented in Section 3.0 of the MWP (URS, 2003). General information on site-specific conditions, as revealed by previous investigations, is presented in Section 2.0 of this report.

C.1 DATA COLLECTION ACTIVITIES

Historical aerial photographs and previous investigation data were reviewed, and surface and borehole geophysical surveys were conducted by Geophex. These data were used to initially evaluate the potential horizontal and vertical extent of the former Landfill and to locate RFI soil borings, test pits, and follow up geophysical surveys at SWMU 40/71.

Pertinent data points used to evaluate subsurface conditions are shown on Figure C-1. The data points include VI borings and groundwater monitoring wells, RFI soil borings and test pits, and selected bedrock outcrops. Field investigation methods for the RFI data collection activities are discussed in Section 3.4 and RFI field activities are discussed below.

C.1.1 Soil Borings

Sixteen direct-push soil borings were completed to refusal, which presumably occurred on weathered bedrock (see Figure C-1). Boring depths ranged from 6.0 ft bgs (40SB13) to 44.8 ft bgs (40SB4). Summary data for the soil borings completed at SWMU 40/71 are presented in Table C-1. Boring logs are included in Appendix C.2.

C.1.2 Test Pits

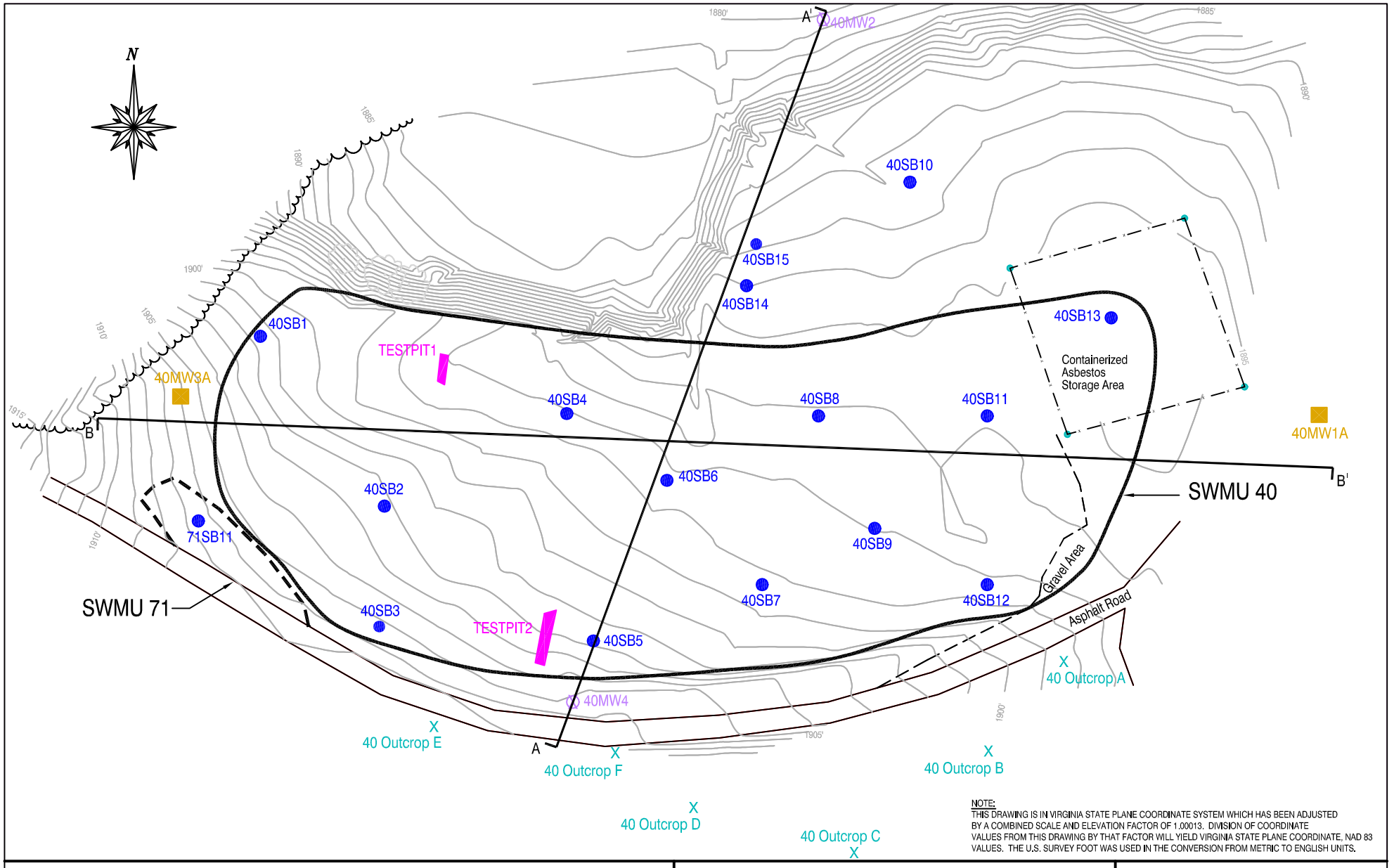
Two backhoe test pits (Test Pit 1 and Test Pit 2) were excavated at areas within SWMU 40 (see Figure C-1). Test pit logs are included in Appendix C.2.

Test Pit 1 was excavated to a depth of 13.7 ft bgs within the northwestern part of SWMU 40 in an area of geophysical anomalies identified by Geophex. Landfill material was encountered in this test pit from a depth of 1 ft bgs to the termination depth. Water seepage from the landfill material into Test Pit 1 was observed at a depth of 11 ft bgs.

Test Pit 2 was excavated to near the southern edge of SWMU 40 to further evaluate the southern extent of landfill material and its nature. This test pit was excavated to refusal on weathered bedrock, which occurred at depths ranging from 4.5 ft bgs (south end) to 13 ft bgs (north end). Approximately 2 ft of landfill material was encountered at the southern end of the test pit, which was underlain by approximately 1 ft of residual soil above weathered bedrock. Approximately 6.5 ft of landfill material was encountered at the northern end of the test pit, which was underlain by 2 ft of residual soil above weathered bedrock. Water seepage was not observed in Test Pit 2.

C.1.3 Physical Soil Testing

Four soil samples from the soil borings were submitted to the URS geotechnical laboratory in Totawa, New Jersey for physical soil testing. Physical testing parameters are described in Table 3-1 and in Section 3.2. Testing results are summarized in Table C-2, with complete analytical results in Appendix C.6.



NOTE:
THIS DRAWING IS IN VIRGINIA STATE PLANE COORDINATE SYSTEM WHICH HAS BEEN ADJUSTED BY A COMBINED SCALE AND ELEVATION FACTOR OF 1.00013. DIVISION OF COORDINATE VALUES FROM THIS DRAWING BY THAT FACTOR WILL YIELD VIRGINIA STATE PLANE COORDINATE, NAD 83 VALUES. THE U.S. SURVEY FOOT WAS USED IN THE CONVERSION FROM METRIC TO ENGLISH UNITS.

Legend

- 1915 — Topographic Contour Line
- Fence
- X 40 Outcrop B — RFI Bedrock Outcrop
- TESTPIT1 — RFI Test Pit
- 40SB8 — RFI Soil Boring
- 40MW2 — VI Groundwater Monitoring Well
- 40MW3A — VI Boring
- A — A' — Geologic Cross-section

0 — 60'

1 Inch = 60 feet

RFAAP
SWMU 40/71 RFI

Date:	Prepared By:
November 2003	KDC/CL
Scale:	**File Name:**
1" = 60'	21354880

FIGURE C-1

RFI Geologic Data Points

Table C-1
Soil Boring, Test Pit, and Bedrock Outcrop Data
SWMU 40/71 RCRA Facility Investigation Report
Radford Army Ammunition Plant, Radford, Virginia

Data Point ID No.	Date	Elevation				Depth to Bottom			Thickness			Comments
		Ground Surface	Refusal (Top of Bedrock)	Top of Landfill Material	Bottom of Landfill Mat / Top Residual Soil	Soil Fill	Landfill Material	Boring Refusal	Soil Fill	Landfill Material	Residual Soil	
SWMU 40 - Landfill												
40SB1	15-Nov-02	1901.9	1890.9	1898.9	1893.8	3.0	8.1	11.0	3.0	5.1	2.9	Landfill Material
40SB2	15-Nov-02	1902.1	1887.0	1900.8	1888.1	1.3	14.0	15.1	1.3	12.7	1.1	Landfill Material
40SB3	14-Nov-02	1905.3	1896.4		1903.2	2.1		8.9	2.1		6.8	No Landfill Material
40SB4	14-Nov-02	1896.6	1851.8	1893.1	1878.6	3.5	18.0	44.8	3.5	14.5	26.8	Landfill Material
40SB5	14-Nov-02	1901.8	1892.8	1899.3	1893.8	2.5	8.0	9.0	2.5	5.5	1.0	Landfill Material
40SB6	13-Nov-02	1897.9	1881.0	1893.9	1882.0	4.0	15.9	16.9	4.0	11.9	1.0	Landfill Material
40SB7	13-Nov-02	1898.4	1877.4	1891.9	1881.4	6.5	17.0	21.0	6.5	10.5	4.0	Landfill Material
40SB8	13-Nov-02	1896.2	1871.1	1889.7	1878.2	6.5	18.0	25.1	6.5	11.5	7.1	Landfill Material
40SB9	13-Nov-02	1897.0	1877.0	1892.5	1882.0	4.5	15.0	20.0	4.5	10.5	5.0	Landfill Material
40SB10	13-Nov-02	1892.7	1877.8		1889.7	3.0		14.9	3.0		11.9	No Landfill Material
40SB11	12-Nov-02	1895.9	1870.1	1891.9	1882.9	4.0	13.0	25.8	4.0	9.0	12.8	Landfill Material
40SB12	11-Nov-02	1897.2	1870.2		1894.7	2.5		27.0	2.5		24.5	No Landfill Material
40SB13	19-Nov-02	1895.5	1889.3		1890.3	5.2		6.2	5.2		1.0	No Landfill Material
40SB14	18-Nov-02	1893.9	1880.5		1885.9	8.0		13.4	8.0		5.4	No Landfill Material
40SB15	18-Nov-02	1892.9	1861.4		1881.9	11.0		31.5	11.0		20.5	No Landfill Material
40MW1A	21-Oct-91	1892	1890		1892.0			2.0	0.0		2.0	No Landfill Material
40MW2	20-Oct-91	1881	1864		1881.0			17.0	0.0		17.0	No Landfill Material
40MW3A	18-Oct-91	1905	1901		1904.0	1.0		4.5	1.0		3.5	No Landfill Material
40MW4	28-Oct-91	1906	1892		1905.0	1.0		14.0	1.0		13.0	No Landfill Material
TEST PIT 40TP-1	20-Nov-02	1897.3		1896.3	< 1882.6	1.0	> 13.7		1.0	12.7		Refusal not reached *
TEST PIT 40TP-2	20-Nov-02	1903.5	1890.5	1899.0	1892.5	4.5	11.0	13.0	4.5	6.5	2.0	Refusal south edge
40 OUTCROP A		1898.4	1898.4									Strike 110.0 Dip 15.0
40 OUTCROP B		1900.1	1900.1									Strike 111.0 Dip 16.0
40 OUTCROP C		1912.3	1912.3									Strike 112.0 Dip 12.0
40 OUTCROP D		1910.4	1910.4									Strike 114.0 to Dip 12.0
40 OUTCROP E		1908.5	1908.5									Strike 115.0 to Dip 15.0
40 OUTCROP F		1907.3	1907.3									Strike 111.0 to Dip 16.0
SWMU 71 - Flash-Burn Area												
71 SB11	18-Nov-02	1906.6	1899.7		1904.4	2.2		6.9	2.2		4.7	No Landfill Material

Table C-2
Soil Physical Testing Results
SWMU 40/71 RCRA Facility Investigation Report
Radford Army Ammunition Plant, Radford, Virginia

Soil Sample				Physical Analyses															
Location	Depth (feet) bgs	SWMU 40/71 Geologic Unit	USCS Soil Type	Water Content (D2216)	Liquid Limit (D4318)	Plastic Limit (D4318)	Plastic Ind. (D4318)	Sieve Minus No. 200 (D422)	Hydrometer % Minus 2 µm (D422)	pH Distilled Water (D4972)	pH 0.01 M CaCl Solution (D4972)	Organic Content (D2974)	Soil Particle Density (D854)	Total Bulk Density (D2937)	Dry Bulk Density (D2937)	Hydraulic Conductivity (D5084)	Total Soil Porosity (Calculated)	Air-Filled Soil Porosity (Calculated)	Water-Filled Soil Porosity (Calculated)
				%	-	-	-	%	%	--	--	%	--	pcf	pcf	cm/sec	-	-	-
40SB4	**0 - 4**	**Soil Fill**	**CL**	18.1	35	13	22	60.9	27	6.8	6.6	5.5	2.687	129.0	109.2	6.6E-08	0.35	0.02	0.33
40SB4	**30 - 32**	**Residual Soil**	**CH**	41.0	50	23	27	79.9	33	6.5	6.4	3.0	2.691	114.9	81.4	8.5E-08	0.52	0.00	0.52
40SB9	**0 - 4**	**Soil Fill**	**CL**	19.4	30	14	16	nt*	nt*	8.8	7.5	2.8	2.692	131.9	110.5	2.7E-09	0.34	0.00	0.34
71SB11	**3 - 5**	**Residual Soil**	**CH**	32.1	55	23	32	95.1	53	6.6	6.4	4.1	2.685	117.2	88.7	1.1E-07	0.47	0.01	0.46

Notes:
nt* = Not tested because of insufficient sample quantity
bgs = Below ground surface
pcf = Pounds per cubic foot
cm/s = centimeters per second
USCS = Unified Soil Classification System
CL = Low Plasticity Clay
CH = High Plasticity Clay
(D2216) = ASTM Test Method
Unconsol = Unconsolidated
-- = Unitless

Two samples submitted for testing were representative of the surface soil fill material overlying the landfill material at SWMU 40; these samples were collected from borings 40SB4 and 40SB9 at a depth interval of 0 to 4 ft bgs. The remaining two samples submitted for testing were representative of undisturbed naturally occurring subsurface residual soil present below landfill material and above weathered bedrock; these samples were collected from borings 40SB4 (32 to 39 ft bgs) and 71SB11 (3 to 5 ft bgs).

C.1.4 Evaluation of Bedrock Outcrops

Six outcrops of the Cambrian-Age Elbrook Formation were examined during the RFI at locations just south of the asphalt road that runs along the southern boundary of SWMU 40/71 (Figure C-1). Exposed bedrock at the five outcrops was geologically described and the strike and dip of bedding were measured. Outcrop elevation data and strike and dip measurements are summarized in Table C-1 and in Section C.1.4.

C.2 GEOPHYSICAL SURVEYS

Surface geophysical surveys and borehole geophysical logging were performed at SWMU 40/71 by Geophex before preparation of WPA 14. The objectives of the Geophex surveys were to characterize subsurface conditions and develop a preliminary estimate of the extent of the former Landfill.

ANL conducted follow-up geophysical surveys during the RFI, which included both surface and subsurface components. The objectives of the ANL surface survey were to confirm the geophysical models constructed by Geophex, assess the top of weathered bedrock and bedrock, and assist in further definition of the extent of buried material. The objective of the subsurface survey (borehole geophysical logging) was to evaluate subsurface characteristics in two VI monitoring wells to provide control for the surface geophysics.

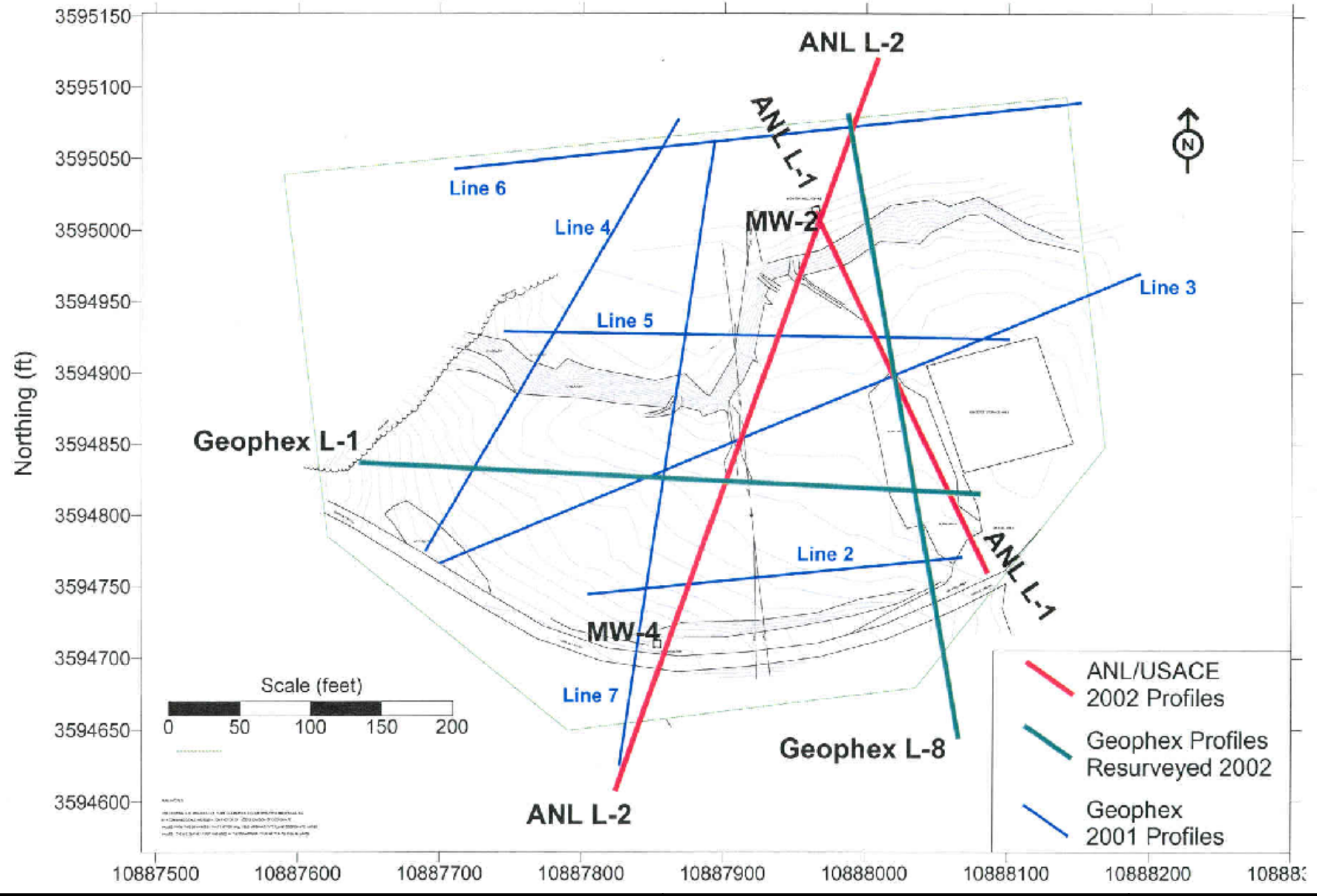
C.2.1 Geophex Survey - 2001

The Geophex geophysical survey used magnetic, EM induction, and DC resistivity methods. Borehole logging of VI monitoring wells 40MW2 and 40MW4 was conducted using natural gamma ray and EM induction methods (conductivity and resistivity). EM and magnetic surveys were conducted on parallel tracklines spaced at intervals of 5 feet. After analysis of the EM and magnetic data, Geophex completed DC resistivity profiles along eight profile tracklines, which included three generally parallel north-south lines (Nos. 4, 7, and 8), and five generally parallel east-west lines (Nos. 1, 2, 3, 5, and 6). The locations of the geophysical tracklines are shown on Figure C-2.

Potential limits of waste disposal at SWMU 40/71 were mapped by the EM survey, as shown on Figures C-3 (1,050-hertz) and C-4 (170-hertz). Additional discussions of the EM survey and other Geophex survey are presented in Section 2.3.4 (previous investigations), in Section C.3.2 as part of the integrated interpretation of subsurface conditions using geophysical, boring, and test pit data, and in the ANL Geophysical Report included in Appendix D.2.

C.2.2 ANL Survey - 2002

The ANL surface geophysical survey used 2D-ERI and seismic refraction profiling/tomography to evaluate changes in the electrical (2D-ERI) and acoustic (seismic) characteristics of subsurface materials. Borehole velocity surveys were conducted in VI monitoring wells 40MW2 to 57 feet bgs and 40MW4 to



Legend

MW-4 □	VI Groundwater Monitoring Well (40MW2 and 40MW4)
ANL	Argonne National Laboratory
Geophex	Geophex Services, Ltd.

*Note: Modified from Argonne National Laboratory, April 2003.

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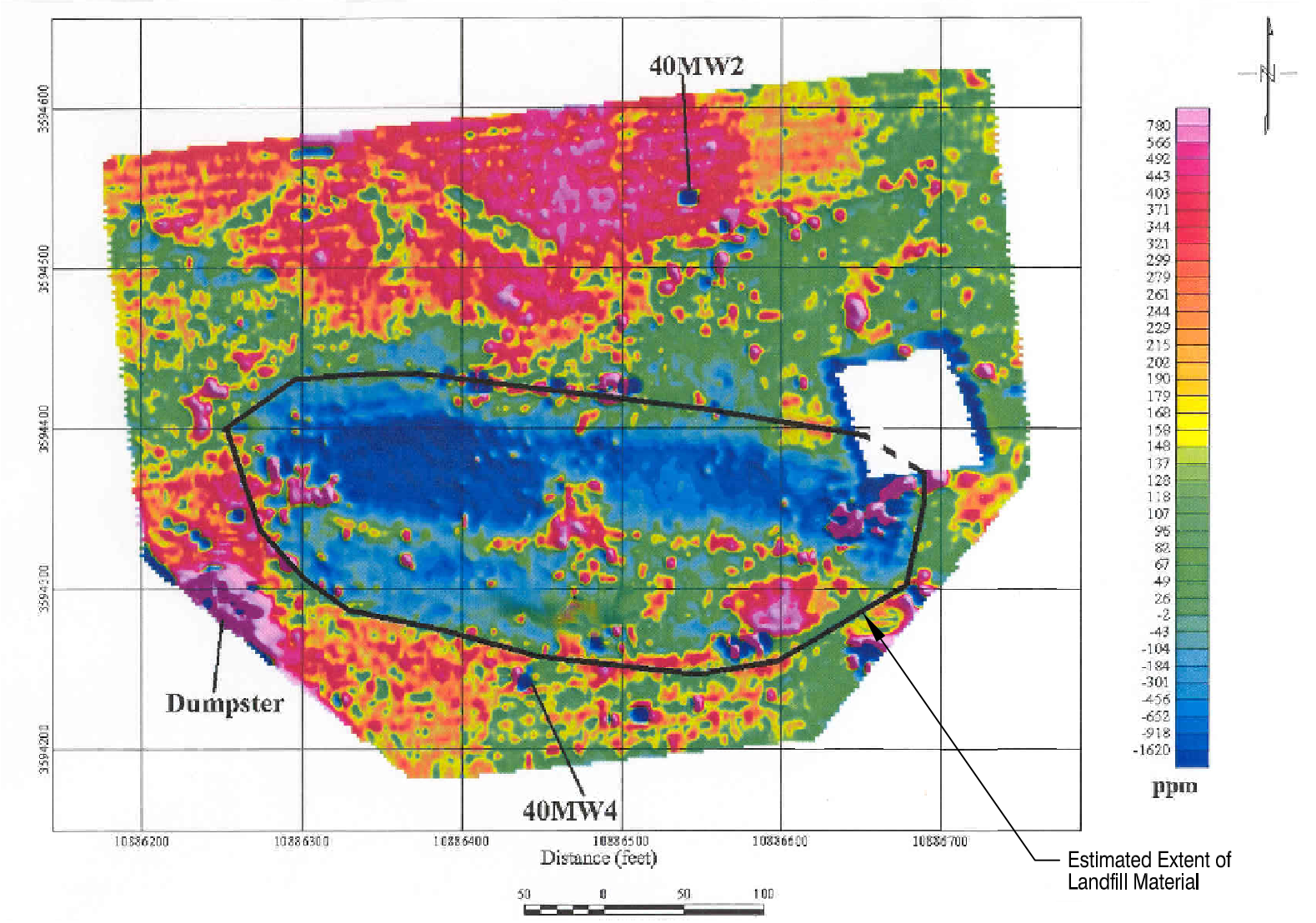
SWMU 40/71 RFI

Date:	Prepared By:
November 2003	KDC/CL
Scale:	**File Name:**
1" = 100'	21354880

FIGURE C-2

Surface Geophysical Survey Profile Lines



Legend

40MW4 **VI Monitoring Well**

***Note:** **Modified from Geophex Services, Ltd., May, 2001.**

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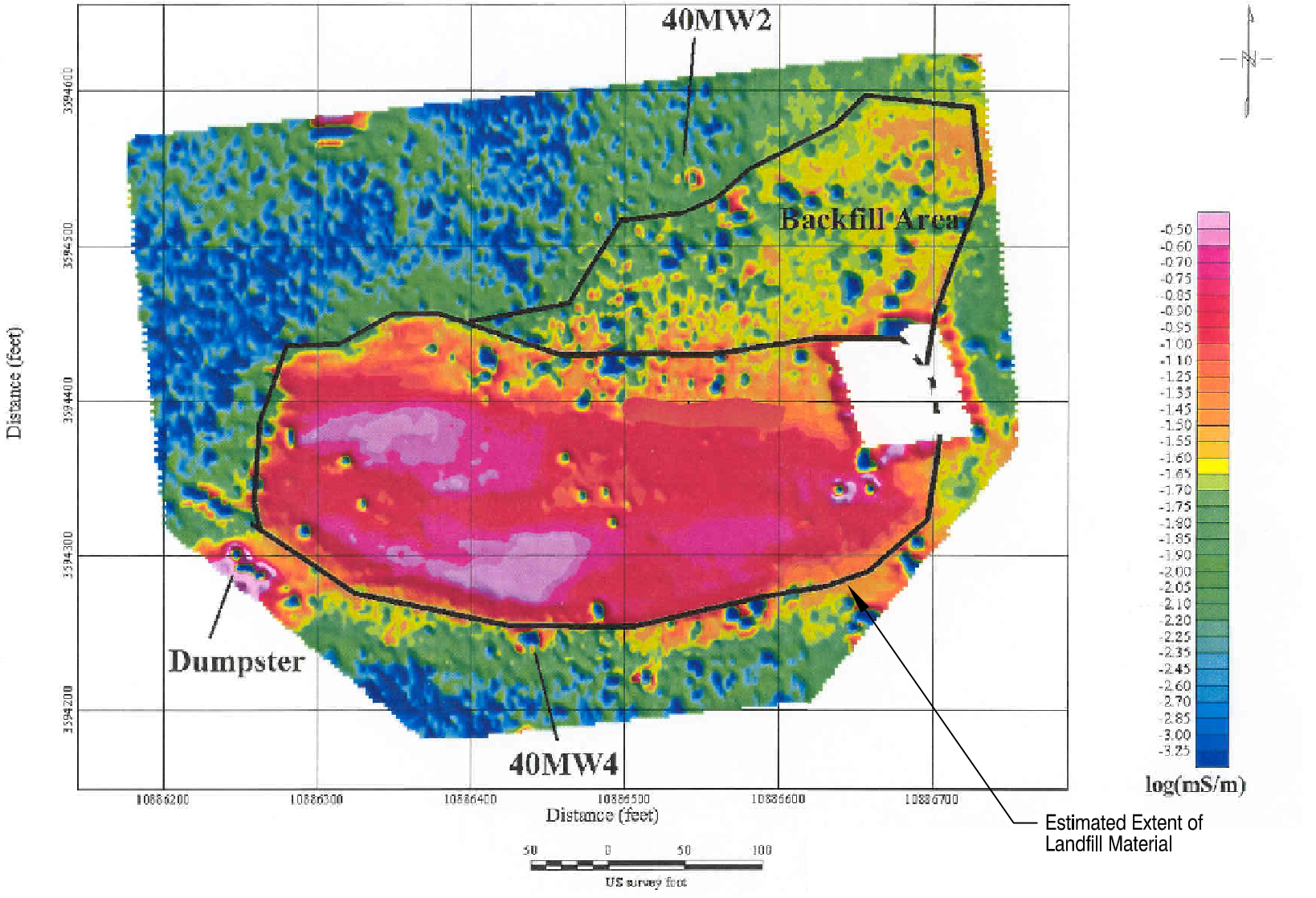
Date: *November 2003*	**Prepared By:** *KDC/CL*
Scale: *1" = 100'*	**File Name:** *21354880*

FIGURE C-3

Geophex EM 1,050 Hz. Inphase Survey



Legend

40MW4 VI Monitoring Well

*Note: Modified from Geophex Services, Ltd., May, 2001.

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Scale:	**File Name:**
1" = 100'	*21354880*

FIGURE C-4

Geophex EM 4, 170 Hz. Apparent Conductivity

64 feet bgs to provide confirmatory/baseline information concerning the subsurface geologic-material for the seismic refraction models.

The ANL surface geophysical surveys were performed along four profile tracklines at SMWU 40/71 shown on Figure C-2 as described below.

ANL Profile L-2 (see Figure C-5) – Both 2D-ERI and seismic refraction profiling/tomography surveys were performed along this north south profile that connects monitoring wells 40MW2 and 40MW4, which were used as subsurface control points;

ANL Profile L-1 (see Figure C-6) – Both 2D-ERI and seismic refraction profiling/tomography surveys were performed along this north south profile tied to monitoring well 40MW-2;

Geophex Profile L-8 (see Figure C-6) – ANL reprocessed existing Geophex data along this profile and completed a new 2D-ERI survey; and

Geophex Profile L-1 (see Figure C-7) – ANL reprocessed existing Geophex data along this profile and completed a new 2D-ERI survey.

Interpretations of the above profiles and subsurface geophysical data are presented in Sections C.3.1 through C.3.3 as part of the integrated geologic analysis of the geophysical and geotechnical data collected at SWMU 40/71 for the RFI.

C.3 SUBSURFACE CONDITIONS

In addition to the geophysical surveys, subsurface conditions at SWMU 40/71 were evaluated for the RFI through the drilling of 16 soil borings and excavation of two backhoe test pits. In addition, six outcrops of the Elbrook Formation were geologically assessed. The locations of the RFI boreholes, test pits, and bedrock outcrops are shown on Figure C-1.

Subsurface investigations have identified four strata underlying the SWMU 40/71, which consist of from top down: soil fill, landfill material, residual soil, and bedrock. The following sections discuss the nature of these strata and present integrated geological interpretations of the geophysical and geotechnical data collected at SWMU 40/71.

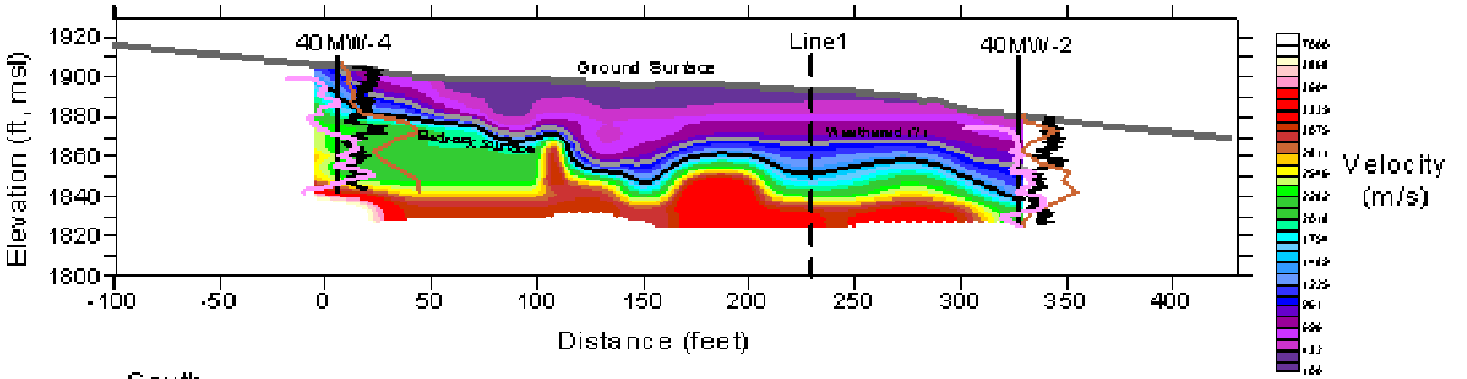
Two geological cross-sections (A-A' and B-B') have been constructed to show the interpreted geologic conditions in the area of SWMU 40/71. Cross-section A-A' is oriented along Profile ANL-2, which runs north south across SWMU 40 between monitoring wells 40MW2 and 40MW4 (see Figure C-8). Cross-section B-B' is oriented along Geophex Profile L-1, which runs east west across the center of SWMU 40 (see Figure C-9).

C.3.1 Soil Fill

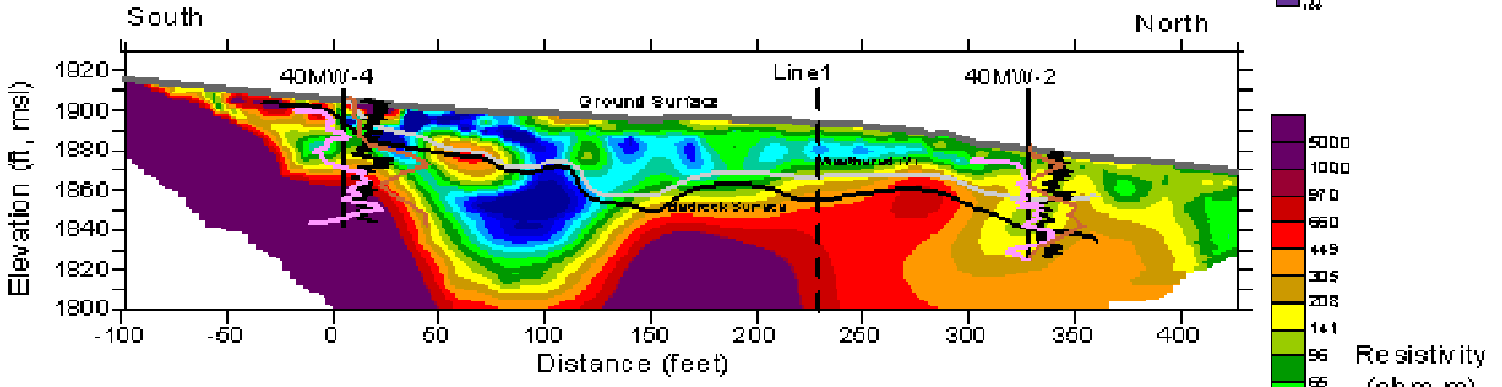
Soil fill material is present at the surface and across the area of SWMU 40/71 extending to the base of the scarp located north of SWMU 40. The thickness of fill material encountered at boring and test pit locations ranged from 1 ft at the southern and eastern periphery of SWMU 40 to 11 ft at boring 40SB15 located north of SWMU 40. Within the area of SWMU 40, soil fill material caps underlying landfill material, with a maximum observed thickness of 6.5 ft above the landfill material (see Table C-1). Soil fill material generally consists of dark brown to yellowish brown lean clay (CL) and sandy lean clay (CL) with variable gravel at the surface or near surface. A more extensive area of surface gravel and cinder

SWMU 40/71 ANL Profile L-2

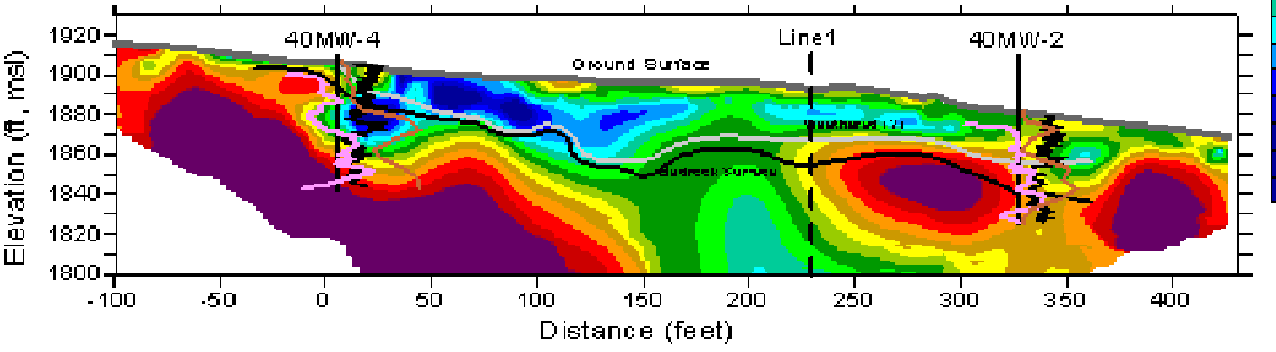
Seismic Tomography Model



2D-ERI Dipole-Dipole Model



2D-ERI Schlumberger Model



Legend

VI Monitoring Well

ANL Profile Line 1

*Note: Source: Argonne National Laboratories (ANL) (2003)

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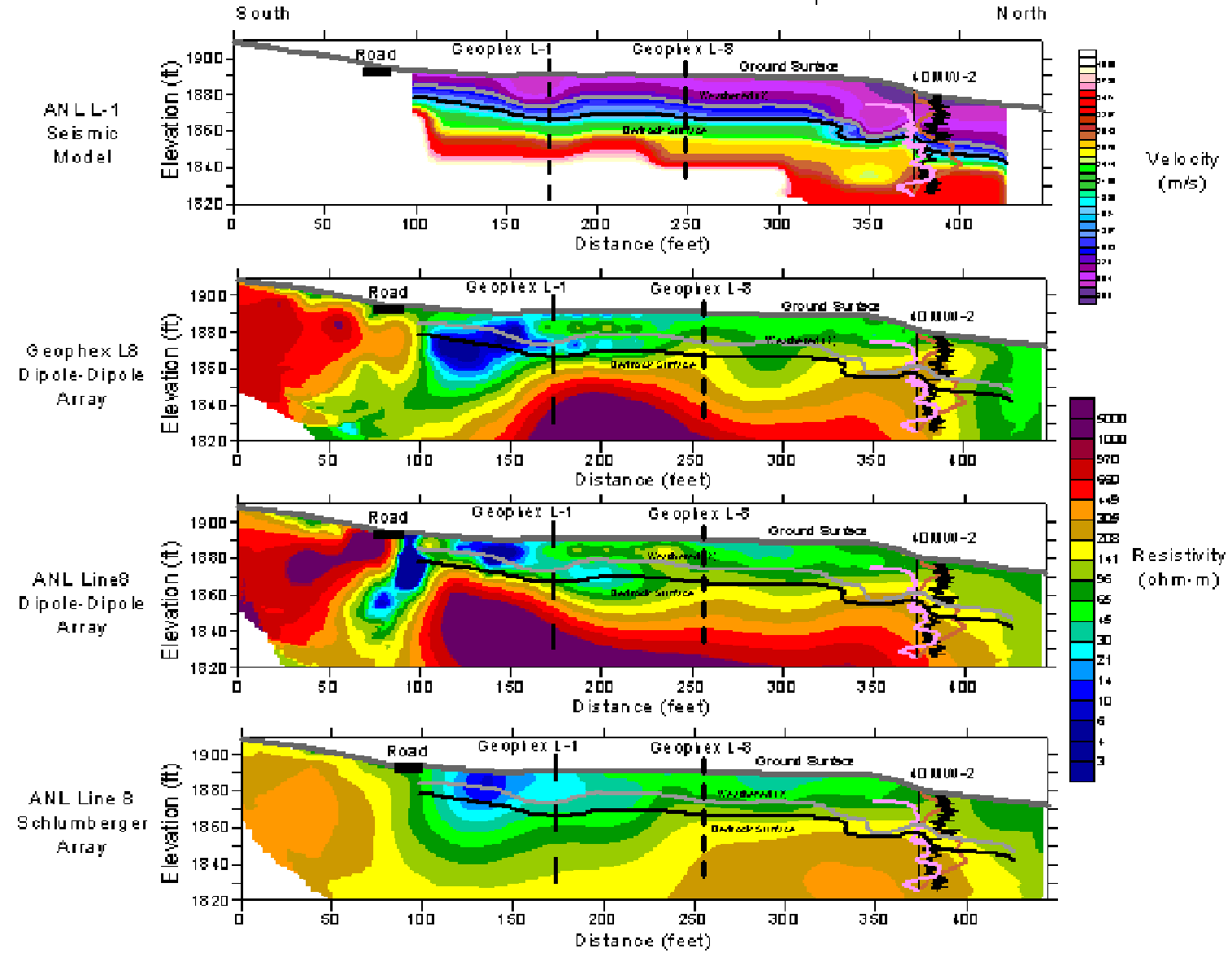
FIGURE C-5

ANL Geophysical Surveys Profile Line ANL L-2



Legend

VI Monitoring Well

ANL Profile Line 1

*Note: Source: Argonne National Laboratories (ANL) (2003)

RFAAP

SWMU 40/71 RFI

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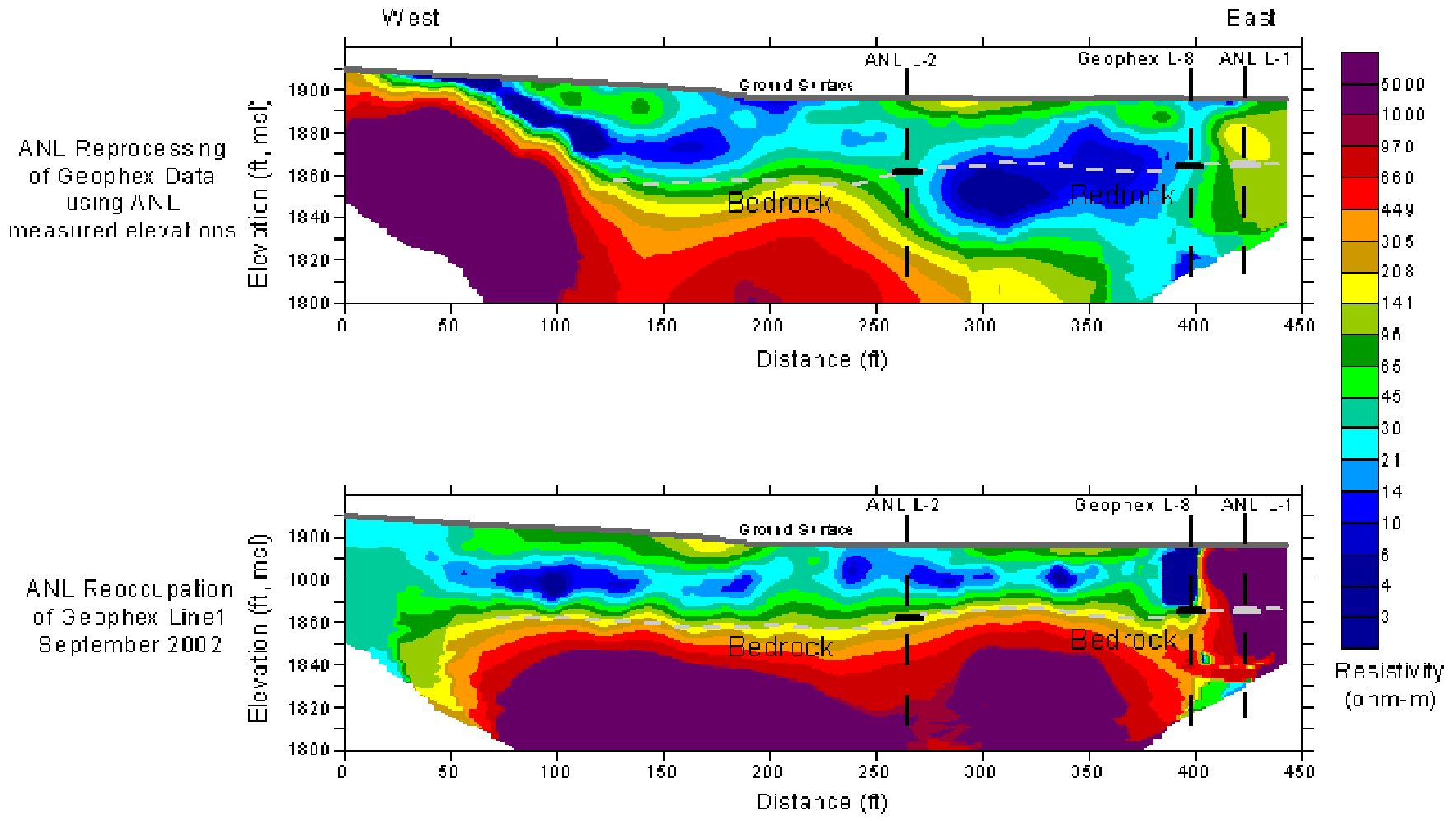
November 2003	*KDC/CL*
Scale:	**File Name:**
As Shown	*21354880*

FIGURE C-6

ANL Geophysical Surveys Profile Line ANL L-1 and Geophex Profile L-8

SWMU-40/71
Geophex Line-1



Legend

VI Monitoring Well

ANL Profile Line 1

*Note: Source: Argonne National Laboratories (ANL) (2003)

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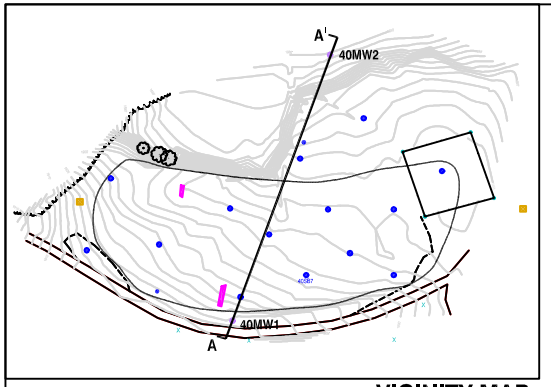
SWMU 40/71 RFI

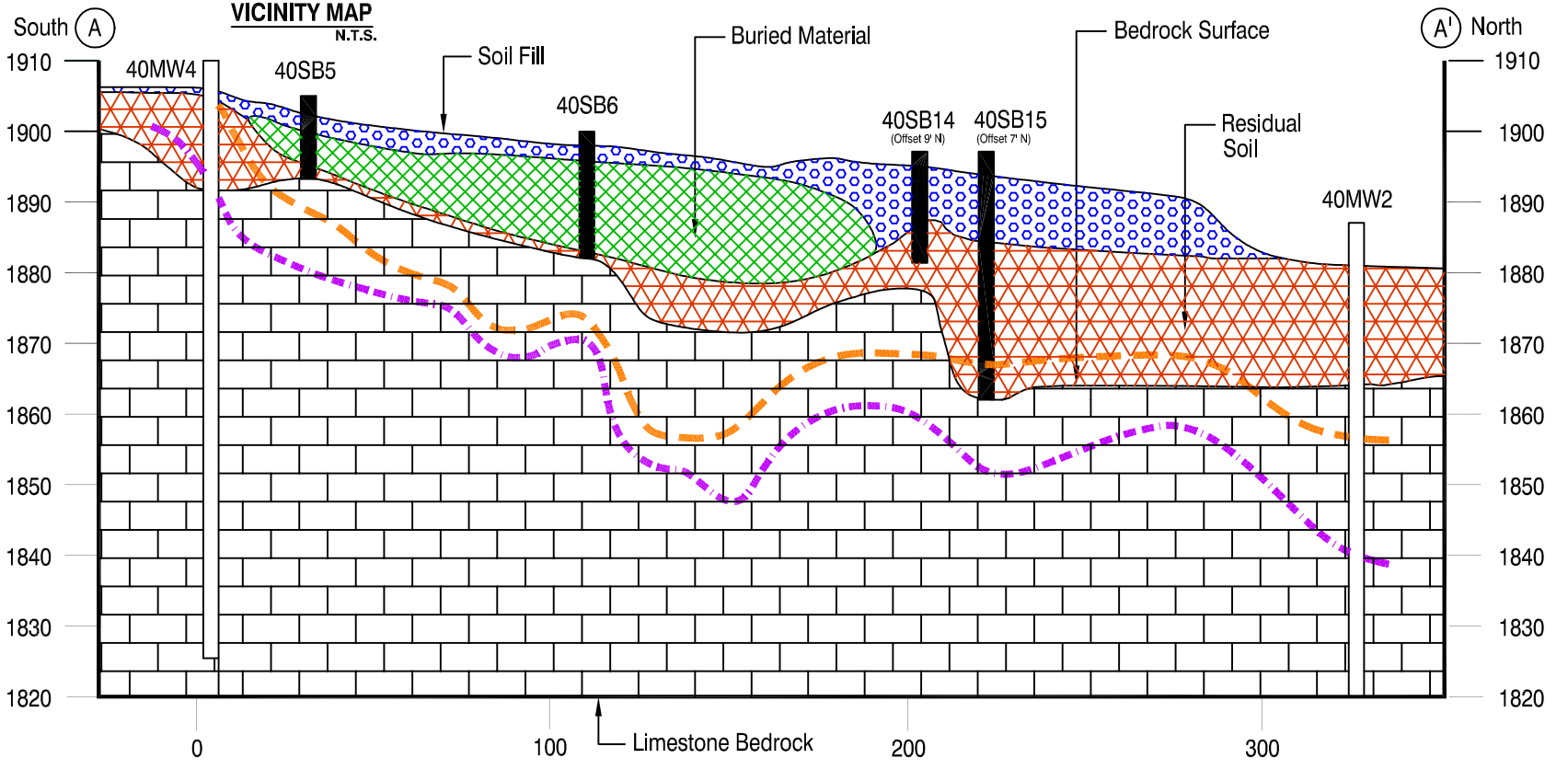
Date:	Prepared By:
November 2003	*KDC/CL*
Scale:	**File Name:**
As Shown	*21354880*

FIGURE C-7

ANL Geophysical Surveys Geophex Profile L-1



VICINITY MAP
N.T.S.



Legend

- RFI Soil Boring
- VI Monitoring Well
- Top of Weathered Bedrock - Seismic Tomography Survey - ANL L-2 Profile (ANL 2003)
- Top of Bedrock - Selsmlc Tomography Survey - ANL L-2 Profile (ANL 2003)

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SWMU 40/71 RFI

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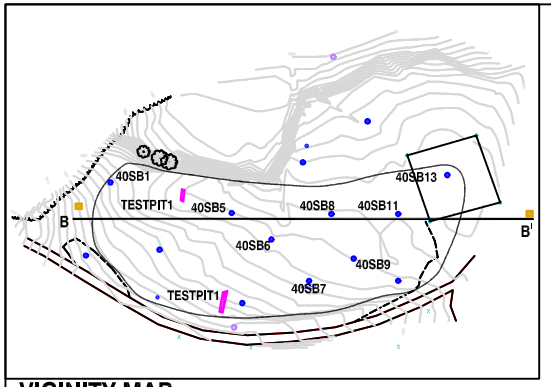
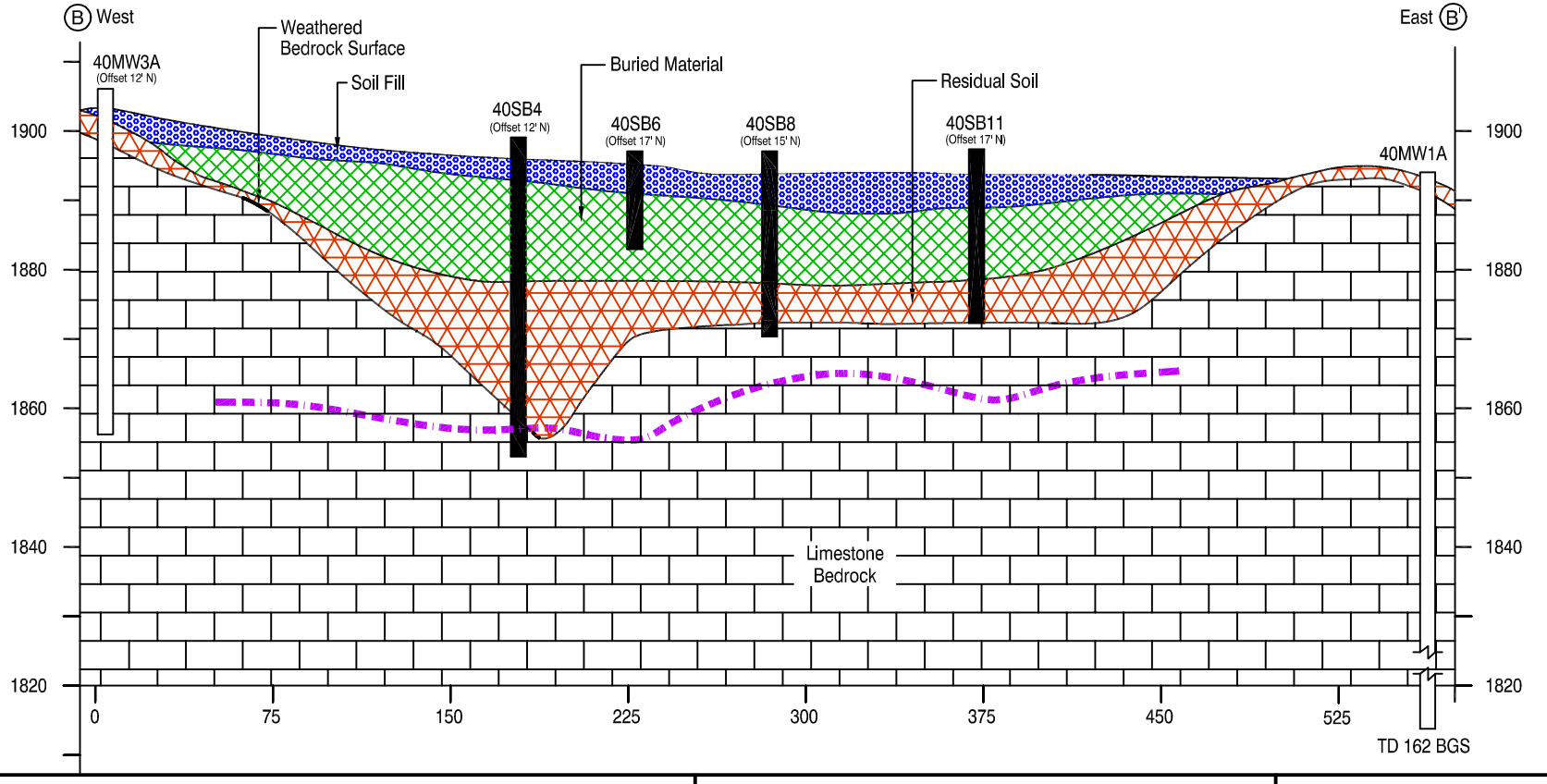
Scale: *1"=50' (Horizontal)* *1"=25' (Vertical)*	**File Name:** *21354880*

FIGURE C-8

Geologic Cross-section A-A'



VICINITY MAP
N.T.S.



Legend

- RFI Soil Boring
- VI Boring

Notes: BGS = Below Ground Surface
TD = Total Depth

Top of Bedrock - Tomography Survey - Geophex L-1 Profile (ANL 2003) (Line Inferred From Discreet Survey Points East of 40SB4)

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SWMU 40/71 RFI

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Scale: *1"=75' (Horizontal)* *1"=25' (Vertical)*	**File Name:** *21354880*

FIGURE C-9

Geologic Cross-section B-B'

material is present in the eastern part of SWMU 40 (Cindered Area and Asbestos Storage Area) and in SWMU 71 (see Figure C-1). Geologic cross-sections A-A' and B-B' show the extent and nature of soil fill material across the SWMU 40/71 area in north-south and east-west directions, respectively.

Two representative samples of soil fill material collected from borings 40SB4 and 40SB9 were submitted for physical testing. Samples 40SB4 and 40SB9 were classified as sandy lean clay (CL) with moisture contents in the range of 18 to 19 %. Both samples had low vertical hydraulic conductivities in the range of 10^{-8} to 10^{-9} centimeters per second (cm/sec). Percent organic content was 5.5 % for sample 40SB4 and 2.8 percent for sample 40SB9. Samples 40SB4 and 40SB9 had slightly acidic and basic pH values, respectively (see Table C-2 and Appendix C.6).

C.3.2 Landfill Material

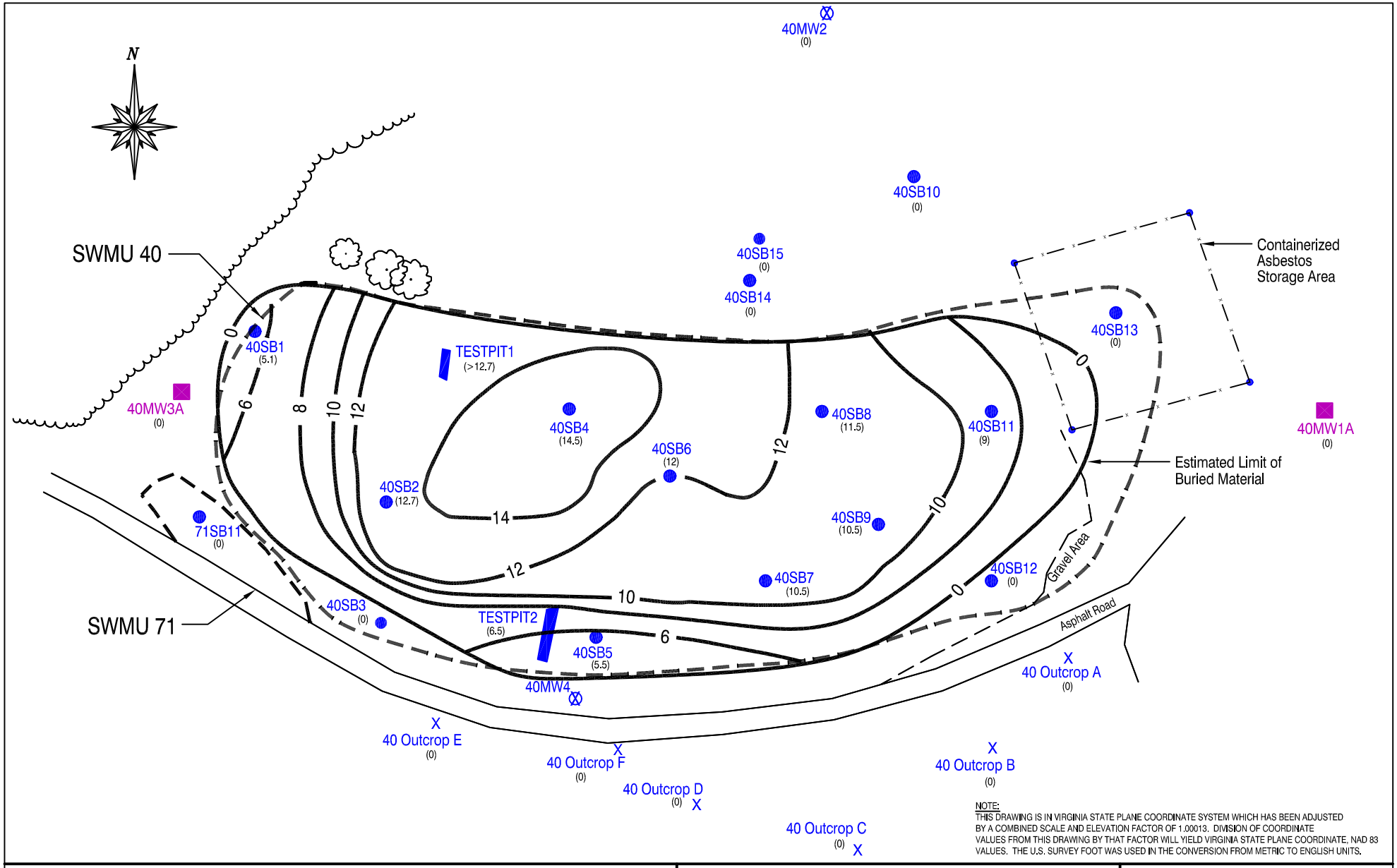
Landfill material underlies soil fill within the area of SWMU 40. In general, this material consists of gray to black clay, sand, gravel, and cinders mixed with abundant paper, glass, plastic, metal, wood chips, rubber, and bagged garbage. Landfill material was described as moist to wet with an odor ranging from sulfurous to strongly acrid and bitter. In some areas, such as boring 40SB6, the landfill material sequence was composed primarily of soil fill with only a minor amount of other types of material. Fluid seepage from landfill material occurred within Test Pit 1, with an accumulation of 2 to 3 ft of water observed in the bottom of the test pit after three hours. Landfill material was described as wet at soil borings 40SB6, 40SB7, 40SB8, and 40SB9 completed near of the center of the landfill area.

Figure C-10 shows the approximately lateral extent and thickness of landfill material as defined by borings and test pits completed at SWMU 40/71. The lateral extent of this material is generally at or within the boundary of SWMU 40. EM surveys conducted by Geophex are in general agreement with the lateral delineation provided by the borings and test pits; the exception being the 170-hertz EM survey, which appears to overestimate the lateral extent of landfill material at the eastern and northern periphery of SWMU 40 compared with the boring data (see Figures C-3 and C-4).

The observed thickness of landfill material ranged from 5.1 ft (boring 40SB1) to 14.5 ft (boring 40SB4). In general, the thickness of landfill material increases from the western, southern, and eastern periphery of SWMU 40 toward the central and northern part of SWMU 40 (see Figure C-10). The top surface of the landfill material generally slopes northeastward across SWMU 40 from an elevation of 1,900 ft msl to 1,890 ft msl; the exception being in the eastern third of SWMU 40 where a slight slope toward the north is apparent (see Figure C-11). Soil boring and test pit investigations confirm that earlier interpretations of 2D-ERI data by Geophex had significantly overestimated the thickness of landfill material; thereby supporting the ANL hypothesis that the presence of broad zones of low-resistivity (< 20 ohm/m) in the 2D-ERI survey were likely related to features in weathered bedrock, such as clay zones (ANL, 2003).

Table C-3 presents volume estimates of landfill material at SWMU 40. Based on the landfill thickness data collected from the borings and test pits, approximately 20,300 cubic yards of landfill material may be present at SWMU 40.

Geologic cross-sections A-A' and B-B' show the extent and nature of landfill material across the SWMU 40/71 area in north-south and east-west directions, respectively.



NOTE:
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Legend

- Fence
- 40 Outcrop B — RFI Bedrock Outcrop
- TESTPIT1 — RFI Test Pit
- 40SB8 — RFI Soil Boring
- 40MW2 — VI Groundwater Monitoring Well
- 40MW3A — VI Boring
- 10 — Isopach Contour Line in Feet
- C.I. = 2.0 Feet

0 60'
1 inch = 60 feet

RFAAP
SWMU 40/71 RFI

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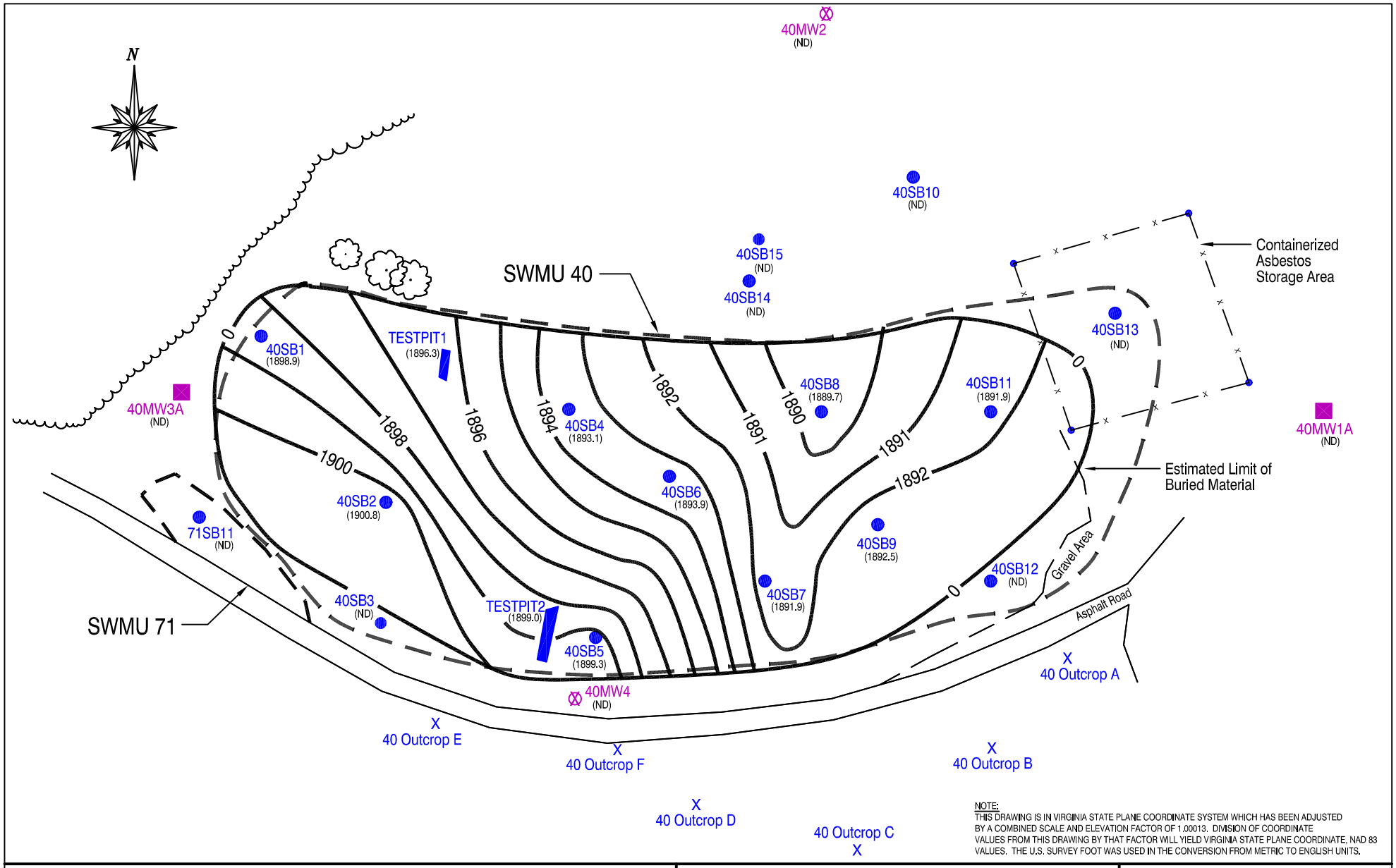
November 2003	KDC/CL
Scale:	**File Name:**
1" = 60'	21354880

FIGURE C-10

Thickness of Buried Material



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Legend

- Fence
- X 40 Outcrop B — RFI Bedrock Outcrop
- TESTPIT1 — RFI Test Pit
- 40SB8 — RFI Soil Boring
- 40MW2 — VI Groundwater Monitoring Well
- 40MW3A — VI Boring
- 1900 — Contour Line in Feet MSL
- C.I. = 1.0 Feet
- ND — No Buried Material Present

0 60'
1 Inch = 60 feet

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SWMU 40/71 RFI

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November 2003	KDC/CL
Scale:	**File Name:**
1" = 60'	21354880

FIGURE C-11

**Structural Contour Map-
Top of Buried Material**

Table C-3
Volume of Landfill Material
SWMU 40/71 RCRA Facility Investigation Report
Radford Army Ammunition Plant, Radford, Virginia

Contour Interval			Estimated Area		Estimated Thickness	Volume of Landfill Material		Estimated Weight * (Tons)	
			(Feet)	(Acres)	(Feet)	(Cu Feet)	(Cu Yards)	28 lbs/ft^3	46 lbs/ft^3
1	> 14	Center	5,292	0.1215	15	79,380	2,940	1,111	1,826
2	12 - 14	Center	12,165	0.279	13	158,145	5,857	2,214	3,637
3	10 - 12	Center	15,598	0.358	11	171,578	6,355	2,402	3,946
4	8 - 10	South	11,046	0.254	9	99,414	3,682	1,392	2,287
5	6 - 8	South	1,263	0.029	7	8,841	327	124	203
6	0 - 6	South	787	0.018	3	2,361	87	33	54
7	8 - 10	West	2,023	0.046	9	18,207	674	255	419
8	6 - 8	West	1,227	0.028	7	8,589	318	120	198
9	0 - 6	West	883	0.020	3	2,649	98	37	61
Totals			50,284	1.15	10.8 **	549,164	20,339	7,688	12,631

Notes:

Cu Feet = Cubic Feet

Cubic Yards

lbs/ft^3 = Pounds Per Cubic Feet

* = Landfill Material Unit Weight Derived from Solid Waste Association of North America, Manager of Landfill Training and Certification Course, January 1989

** = Average Thickness of Landfill Materials

C.3.3 Residual Soil

Residual soil, which has weathered in place from argillaceous carbonate bedrock, underlies landfill material at SWMU 40/71. Outside of the landfill area, residual soil underlies soil fill material. The contact with overlying fill is sharp and is more gradational with underlying weathered rock. Residual soil generally consists of brown to yellowish red clay (CL or CH) with variable sand content and occasional gravel.

Four physical samples of residual soil (VI and RFI) were laboratory classified as CL or CH (see Table C-2). Both RFI physical samples (40SB4 and 71SB11) had low vertical hydraulic conductivities in the range of 10^{-7} to 10^{-8} cm/sec. The organic content of the RFI samples was 3 to 4%, with a slightly acidic pH.

The observed thickness of residual soil within the SWMU 40/71 area ranged from 1 to 27 ft, with an increase in thickness generally observed toward the northern and eastern boundary of SWMU 40 (see Figure C-12). The isopach map shown as Figure C-12 is considered to represent the minimum thickness of residual soil present at the boring locations investigated; since it is assumed that boring refusal by the direct-push unit represents the top of weathered rock. Bedrock outcrops occur south of SWMU 40, where the residual soil unit is absent.

The top surface of the residual soil generally slopes northward across SWMU 40 toward the north central boundary of SWMU 40 (see Figure C-13). This pattern suggests that a single excavation or fill area existed over the majority of the SWMU rather than separate trenches into natural residual soil as originally thought.

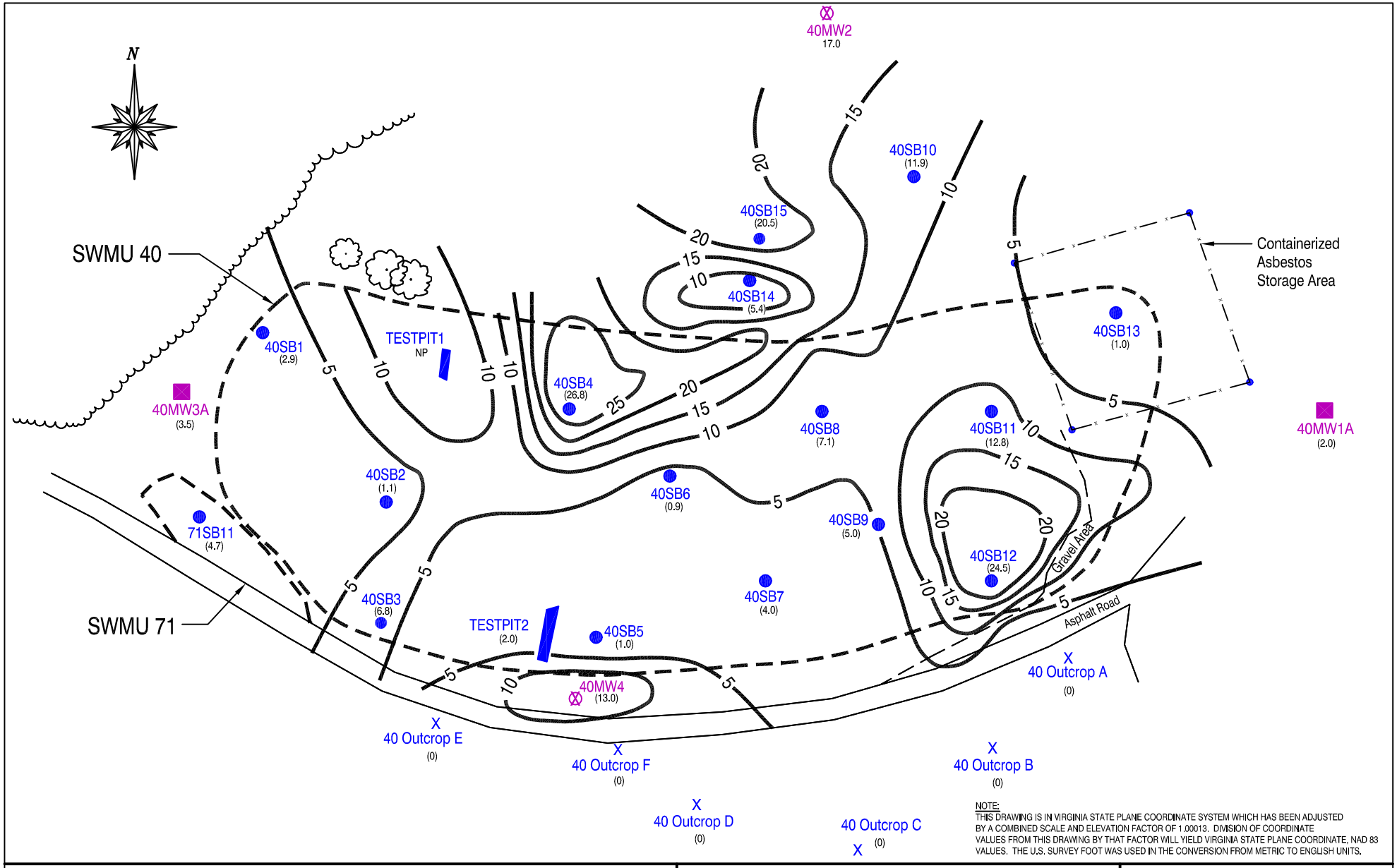
Geologic cross-sections A-A' and B-B' show the extent and nature of residual soil across the SWMU 40/71 area in north-south and east-west directions, respectively.

C.3.4 Bedrock

Previous investigations at SWMU 40/71 indicate that argillaceous carbonate bedrock of the Elbrook Formation underlies the area of SWMU 40/71 (Dames & Moore, 1992). VI borings 40MW1A, 40MW2, 40MW-3, and 40MW4 penetrated 43 to 160 ft of limestone and dolomite bedrock at the periphery of SWMU 40/71 (see Appendix C.1). Bedrock generally consists of light gray to bluish gray limestone or dolomite with some interbedded brown siltstone. Depth to bedrock in the VI borings ranged from 2 to 17 ft bgs (see Table C-1). Several outcrops of bedrock occur immediately south of SWMU 40/71. Strike and dip measurements obtained at five outcrops indicate bedrock strikes in the range of 110 to 115° with bedrock dips ranging from 12 to 16° (see Table C-1).

The consistency of bedrock encountered in the VI borings ranged from soft to hard with numerous zones of intense weathering and fracturing. Clay filled weathered zones and voids were encountered in each of the VI borings, with notable voids and/or weathering at the completion depth of borings 40MW2, 40MW3A, and 40MW4. Zones of more competent bedrock were encountered in boring 40MW1A at depths below the completion depths of the other borings.

In general, weathered bedrock underlies residual soil at SWMU 40/71. The contact between residual soil and weathered bedrock may be abrupt or gradational over several feet, depending on the degree of weathering. For purposes of the RFI intrusive investigation, direct-push boring or test pit refusal was assumed to represent the top of weathered bedrock. However, the upper surface of



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Legend

- Fence
- 40 Outcrop B — RFI Bedrock Outcrop
- TESTPIT1 — RFI Test Pit
- 40SB8 — RFI Soil Boring
- 40MW2 — VI Groundwater Monitoring Well
- 40MW3A — VI Boring
- 10 — Isopach Contour Line in Feet
- C.I. = 5.0 Feet
- NP — Not Penetrated

0 60'
1 inch = 60 feet

RFAAP
SWMU 40/71 RFI

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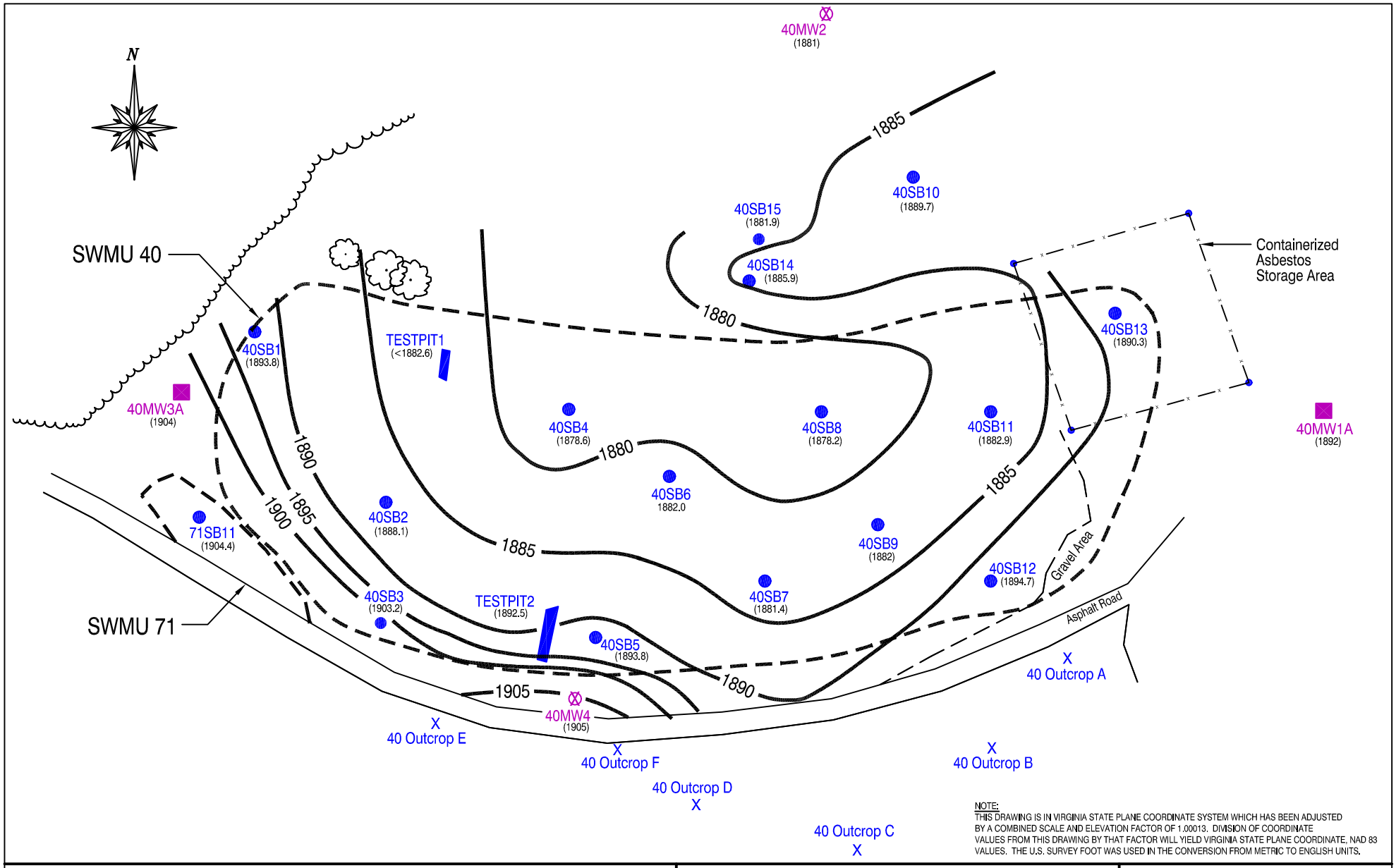
November 2003	KDC/CL
Scale:	**File Name:**
1" = 60'	21354880

FIGURE C-12

Thickness of Residual Soil



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Legend

- Fence
- X 40 Outcrop B — RFI Bedrock Outcrop
- TESTPIT1 — RFI Test Pit
- 40SB8 — RFI Soil Boring
- 40MW2 — VI Groundwater Monitoring Well
- 40MW3A — VI Boring
- 1890 — Contour Line in Feet MSL
- C.I. = 5.0 Feet

0 60'
1 Inch = 60 feet

RFAAP
SWMU 40/71 RFI

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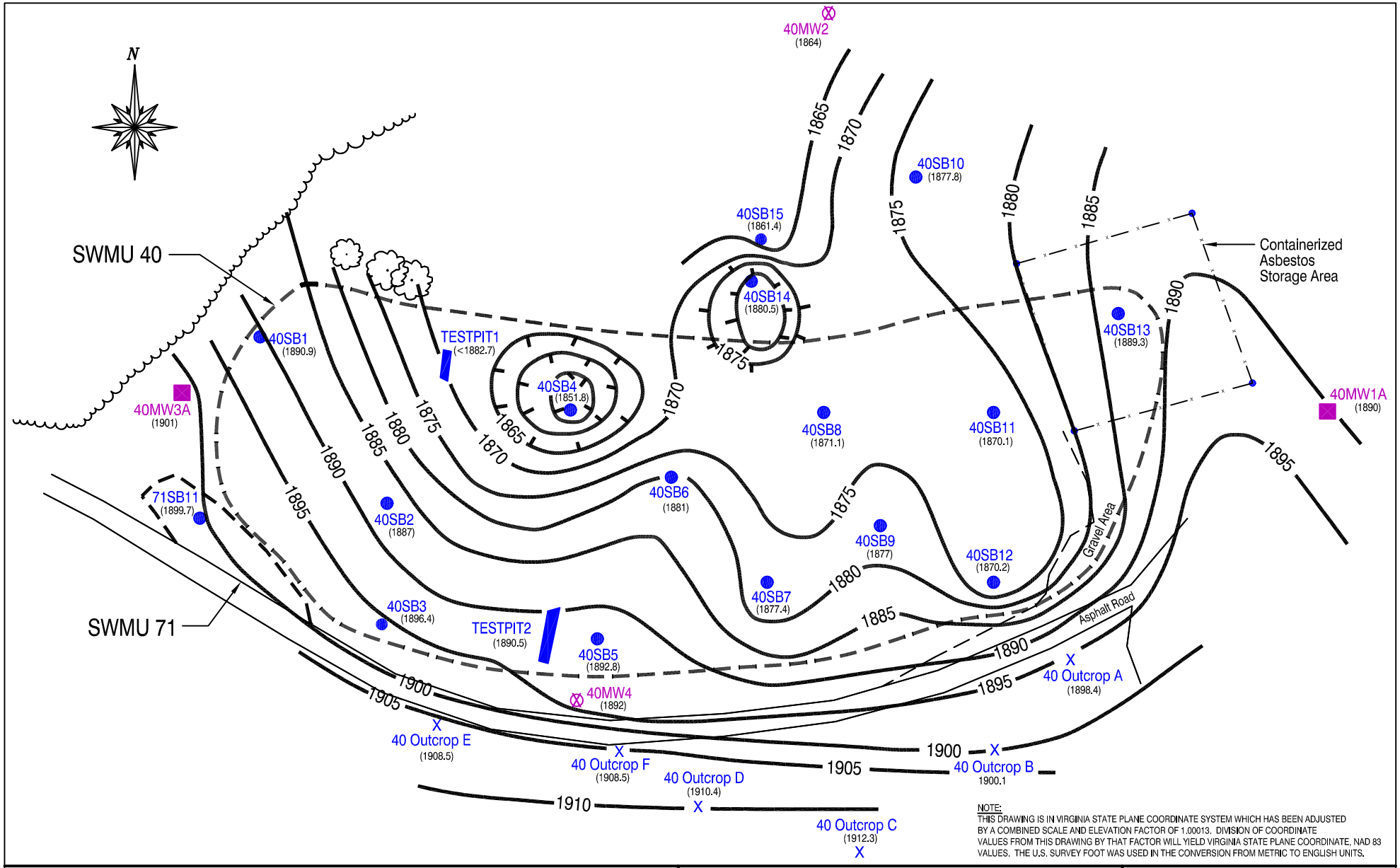
November 2003	KDC/CL
Scale:	**File Name:**
1" = 60'	21354880

FIGURE C-13

Structural Contour Map- Top of Residual Soil



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Legend

- Fence
- X 40 Outcrop B — RFI Bedrock Outcrop
- TESTPIT1 — RFI Test Pit
- 40SB8 — RFI Soil Boring
- 40MW2 — VI Groundwater Monitoring Well
- 40MW3A — VI Boring
- 1900 — Contour Line in Feet MSL
- C.I. = 5.0 Feet

0 60'
1 inch = 60 feet

RFAAP
SWMU 40/71 RFI

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Scale:	**File Name:**
1" = 60'	21354880

FIGURE C-14

**Structural Contour Map-
Top of Weathered Bedrock**

weathered bedrock may be identified at deeper depths with other drilling techniques or by geophysical surveys such as seismic refraction tomography.

The depth of soil boring refusal ranged from 6.2 ft bgs (boring 40SB13) to 44.8 ft bgs (boring 40SB4). Based on the soil boring and test pit data, the elevation of top of weathered bedrock ranges from 1,912 ft msl at the bedrock outcrop area to less than 1,852 ft msl in the north central part of SWMU 40 (see Figure C-14). In general, the weathered bedrock surface slopes from the western, southern, and eastern periphery of SWMU 40/71 toward the north central border of SWMU 40. An apparent depression in the weathered bedrock surface occurs in the area of boring 40SB4, where approximately 45 feet of overburden overlies bedrock (see Figure C-14).

ANL performed borehole velocity surveys in existing VI monitoring wells 40MW2 and 40MW4 to provide control for the surface tomography surveys. In Well 40MW2, seismic velocities increased from approximately 1,900 feet per second (ft/s) to 5,000 ft/s at a depth of approximately 25 ft bgs indicating a change from residual soil to weathered rock. Seismic velocities did not increase at greater depths indicating that a significant degree of weathering was present in the bedrock sequence at this location. At Well 40MW4, an increase in seismic velocity from 2,500 ft/s to 10,000 ft/s occurred at a depth of approximately 25 feet bgs indicating a change from residual soil/weathered bedrock to competent bedrock.

Geophex performed geophysical logging in wells 40MW2 and 40MW4. Gamma logging in 40MW2 indicated three general zones (0-28, 28-49, and >49 feet bgs) that appear to correspond to residual soil (upper zone), weather bedrock (middle zone), and competent bedrock (lower zone). Increased conductivity was also measured at the transition points of the major zones. In the MW404 logs, two general zones were present, 0-30 and >30 feet bgs, with the upper zone corresponding to residual soil and the lower zone with bedrock containing zones of weathered material through the sequence. Summary borehole geophysical logs are shown on the ANL surface geophysical profiles presented in Figures C-5 and C-6.

Geologic cross-sections A-A' and B-B' show the configuration of the weathered bedrock surface as inferred from the soil borings, monitoring well borings, and test pit data. The top of weathered bedrock and top of bedrock inferred from the ANL seismic survey was plotted on these cross-sections to show the differences in the inferred bedrock surface with the different data platforms.

Cross-Section A-A' (Figure C-8) and ANL Profile L-2 (Figure C-5)

Boring data across this profile within the landfill area generally indicates a 5 to 15 ft shallower depth to weathered bedrock than ANL seismic surveys. The weathered bedrock surface modeled by the seismic survey mimics the surface inferred from the soil boring and test pit data; both platforms indicate that bedrock slopes from south to north across the profile on Figure C-8. The seismic survey models the weathered bedrock surface approximately 5 ft higher than suggested by the boring data at locations north of the landfill area and boring 40SB15, except in the area of 40MW2 where this difference is reversed. At the extreme southern end of the profile, the seismic survey indicates a shallower depth to weathered bedrock than that inferred from the boring data.

The 2D-ERI and seismic surveys model weathered bedrock at similar depths at the northern and southern ends of the profile (see Figure C-5). A discrepancy exists between the 2D-ERI dipole-dipole and seismic models within the landfill area. The dipole-dipole solution suggests a major depression in the weathered bedrock surface to depths of 70 to 80 ft bgs contrasted with the 30 to 40 ft bgs projected by the seismic model (see Figure C-5). In this area, the 2D-ERI Schlumberger and seismic models predict a similar

depth to weathered bedrock. The weathered bedrock surface modeled by seismic data and boring data cut through the bedrock low modeled by the dipole-dipole solution. This suggests that clay zones, or other sources of low resistivity present within the bedrock are the cause of the broad zone of low resistivity rather than the presence of landfill material or residual soil.

Cross-Section B-B' (Figure C-9) and Geophex Profile L-1 (Figure C-7)

Boring data across this profile indicate that the surface of weathered bedrock slopes from the eastern and western edges of SWMU 40 toward a bedrock low in the area of soil boring 40SB4. Projected surfaces of weathered bedrock and bedrock are also shown on Figure C-7, as modeled from seismic data along profiles ANL-1/Geophex and ANL-2 where they intersect Geophex L-1. Projections from seismic and boring data are in close agreement from 225X eastward on Figure C-7, with a 3 to 7 ft shallower depth to weathered bedrock indicated by the boring data. Weathered bedrock surfaces projected by seismic and boring data intersect in the area of the bedrock low (165X to 200X). Seismic projections of a level bedrock surface extending to the west of the bedrock low do not correlate with boring data, which indicate an upward sloping weathered bedrock surface from boring 40SB4 to 40MW3A. The bedrock surface modeled by ANL reprocessing of the Geophex 2D-ERI data (dipole-dipole) along L-1 closely correlates with the boring data in this area (see Figure C-7).

Reprocessing of the Geophex 2D-ERI data along L-1 still shows a thick zone of low resistivity in the eastern third of the model. The weathered bedrock surface inferred from the boring data and predicted by the seismic data along this profile cut through the zone of low resistivity. Similar to profile ANL-2, clay zones or other sources of low resistivity present within the bedrock are the likely cause of this broad zone of low resistivity rather than the presence of landfill material or residual soil.

The 2D-ERI data generated by ANL during its reoccupation of Geophex L-1 models bedrock as a high-resistivity zone (>400 ohm-m) with a relatively horizontal top at approximately 1,860 ft msl and slight westward dip of 15 ft over the length of the profile (ANL, 2003). This model is in reasonable agreement with the bedrock surface projected by the seismic data across the profile.

Profiles ANL L-1 and Geophex L-8 (Figure C-6)

The seismic survey along ANL L-1 models a weathered bedrock surface that closely agrees with the elevations and bedrock configuration presented on the structural contour map of weathered bedrock (see Figure C-14). Both data platforms indicate a northward sloping weathered bedrock surface toward Monitoring Well 40MW2.

Reprocessing of the Geophex 2D-ERI data (dipole-dipole) along L-8 indicates that the bedrock surface modeled by resistivity is deeper than that predicted by seismic; the exception being at the northern and southern ends of the profile where the models are in close agreement. There is a larger discrepancy between these models between 100 and 150X, where the resistivity model suggests that landfill material may be present to depths of 40 ft. The weathered bedrock surface modeled by seismic data and boring data cut through this low-resistivity zone; thus, this zone of low-resistivity cannot be attributed to landfill material and is likely related to features of the underlying bedrock.

C.4 Geologic Summary

The shallow geology at SWMU 40/71 generally consists of fill materials overlying natural deposits. SMWU 40, a former landfill, appears to be a laterally contiguous disposal area overlying residual soil, filled with various types of landfill materials, soil, and cinders, and then capped by emplacement of soil fill. The soil fill consists of generally fine-grained materials (sandy clay and clay) that contain lenses of gravel, sand, and cinders. A surface veneer of cinders is present in the eastern portion of SWMU 40. Soil fill at SWMU 71 is mixed with cinders and rests directly upon residual soil.

Residual soil is present beneath the entire landfill and consists of fine-grained material, principally slightly sandy clay, derived from the inplace weathering on the underlying Cambrian-Age Elbrook Formation argillaceous carbonates. The residual soil grades downward into weathered bedrock that, in turn, grades downward into competent carbonate bedrock that contains fractures, cavities, vugs, and other solution features.

A karst depression, potentially a sinkhole or enlarged fracture, in the carbonate bedrock appears to be present in the area of soil boring 40SB4 (see Figures C-9, C-12, and C-14). Relief of at least 15+ ft on the weathered bedrock surface appears to be present in this area; relief is greater (25+ ft) to the northeast where the apparent shallow depth of weathered bedrock at boring 40SB14 may indicate the presence of a karst pinnacle. The depression contains the thickest sequence of residual soil at SWMU 40/71; one of the thinnest natural sequences, i.e. no excavation in the area, is present at boring 40SB14 (Refer to Figure C-12).

The lateral and vertical extent of landfill material in SWMU 40 has been defined through the combination of surface geophysics and subsurface data. Surface geophysics identified the top of weathered bedrock and competent bedrock that varied greatly in depth across the SWMU. Along some profiles, general geophysical trends appear to correspond to elevation configurations projected from soil boring data, but deviations in projected depths of the weathered bedrock surface were present.

APPENDIX B

ATS INTERNATIONAL RESISTIVITY IMAGING SURVEY REPORT

Resistivity Imaging Survey for SWMU-40/71 Radford Army Ammunition Plant (RFAAP) Radford, Virginia

prepared for

URS Corporation
5540 Falmouth Street, Suite 201
Richmond, VA 23230

by

ATS International, Inc.
107 Lester Street
Christiansburg, Virginia 24073

ATS International Project No. P06-04

January 9, 2007

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Figure 1. Portion of road map illustrating the approximate location of SWMU 40-71 and other local features.

Figure 2. Portion of the Radford North USGS 7.5-minute topographic quadrangle illustrating the approximate location of SWMU 40-71 and other local features. (Note the sinkhole which evidently existed prior to the creation of SWMU 40-71).

Figure 3. Portion of the Geologic Map of Virginia illustrating mapped geologic units in the vicinity of the site.

Figure 4. Portion of site layout illustrating the location of SWMU 40-71, the locations of resistivity electrodes and other site features.

Figure 5. Results of Line 1, illustrating data from the pole-dipole array and the dipole-dipole array and anomalies identified.

Figure 6. Results of Line 2, illustrating data from the pole-dipole array and the dipole-dipole array and anomalies identified.

Figure 7. Portion of site layout illustrating electrode flag locations of all favorable drilling targets for new monitoring wells based on interpretation of the resistivity data.

Executive Summary

ATS International, Inc. (ATS) was retained by the URS Corporation (URS) to perform a resistivity imaging study at SWMU-40/71, located within the Radford Army Ammunition Plant (RFAAP) near Radford, Virginia. The objective of this study was to identify drilling targets for the installation of additional monitoring wells in the vicinity of SWMU-40/71. The tasks involved in this study included:

(1) Collection and processing of resistivity imaging data.

(2) Integration and synthesis of geologic data from previous studies into interpretation of new resistivity data for most comprehensive interpretation of new data.

(3) Preparation of this document detailing our methods and findings.

The site and immediate surroundings are underlain by the Cambrian-aged Elbrook Formation, which is comprised of laminated to thick-bedded dolomite, thin- to medium-bedded limestone, and dolomitic platy shale and siltstone. The strike of bedrock in the vicinity of the site is approximately 110°. Within a sinkhole located approximately 250 feet southwest of SWMU-40/71, bedrock was observed to dip approximately 10 to 30 degrees to the south-southwest.

The bedrock subsurface in the vicinity of SWMU-40/71 is highly karstified, with numerous large sinkholes and sinking streams present. In 1996, a dye-trace study revealed that a stream which sinks approximately 200 feet east of SWMU-40/71 flows westward to a spring on the New River. In that study, the dye traveled a distance of 4,800 feet in approximately 24 hours, indicating the presence of an open-flow karst conduit beneath the vicinity of SWMU-40/71.

Data from two resistivity lines were collected at the site. Line 1 was located just north of SWMU-40/71 and was oriented in an east-west direction, while Line 2 was located just west of SWMU-40/71 and was oriented in a northeast-southwest direction.

Leachate from leaking landfills typically results in vertically or laterally extensive zones of abnormally low resistivity values extending from the landfill area. Two zones of abnormally low resistivity values (with values as low as 20 Ohm-meters) are observed in the central portion of Line 1 which may suggest the presence of contamination associated with the former disposal area(s). The nature of these anomalies also suggests that they are located within interpreted karst features or fracture zones.

Of additional note is that the Radford North USGS 7.5-minute topographic quadrangle, which illustrates the surface topography prior to the creation of SWMU-40/71, indicates the prior existence of an enclosed depression (i.e. sinkhole) immediately beneath the current location of SWMU-40/71. Based on this information, it is reasonable to interpret that one or both of the anomalies in that portion of Line 1 likely represent(s) karst solutional features related to that buried sinkhole.

Numerous anomalies are observed in the section for Line 2, with possible fracture zones identified beneath the vicinities of electrodes 2-13, 2-23, and 2-48 and possible karst features identified beneath electrodes 2-13, 2-38 and 2-48.

A total of seven resistivity anomalies are identified as interpreted fracture zones and/or karst features. Each of these anomalies may represent possible locations for intercepting groundwater through the installation of a monitoring well. The selection of monitoring well locations should take into account the 3-dimensional heterogeneity of the karst subsurface, with special consideration given to the fact that groundwater migration through potentially open-flow karst from the vicinity of SWMU-40/71 is not likely to follow normally intuitive parameters.

The fact that a positive dye trace was conducted from the sinkhole at SWMU-17 (on the east side of SWMU-40/71) almost due west to the New River reveals that an open-flow karst conduit exists beneath the vicinity of SWMU-40/71. Given this information, combined with the fact that SWMU-40/71 was evidently constructed immediately above a sinkhole, it is reasonable to expect that groundwater migration from the vicinity of SWMU-40/71 would be primarily to the west, generally along strike, and primarily through relatively well-developed karst conduits.

1. Introduction

ATS International, Inc. (ATS) was retained by the URS Corporation (URS) to perform a resistivity imaging study at SWMU-40/71, located within the Radford Army Ammunition Plant (RFAAP) near Radford, Virginia (Figure 1). SWMU-40/71 is located in the southern portion of the RFAAP property, approximately seven tenths of a mile northwest of the RFAAP Main Entrance on VA Route 114 (Figure 2).

Detailed geophysical studies have been conducted previously at SWMU-40/71 by Geophex Services, Ltd. (May 2001) and Argonne National Laboratory (April 2003). The objectives of those investigations were to characterize the subsurface beneath SWMU-40/71 and to identify the lateral and vertical extents of waste.

The objective of this study was to identify drilling targets for the installation of additional monitoring wells in the vicinity of SWMU-40/71. The tasks involved in this study included:

(1) Collection and processing of resistivity imaging data.

(2) Integration and synthesis of geologic data from previous studies into interpretation of new resistivity data for most comprehensive interpretation of new data.

(3) Preparation of this document detailing our methods and findings.

2. Site Geology

The site is located within the Valley and Ridge Province, which consists of elongate parallel mountain ridges and valleys that are underlain by folded and faulted Paleozoic sedimentary bedrock. These parallel ridges and valleys are the result of differential weathering of layered clastic and carbonate rocks.

The site and immediate surroundings are underlain by the Cambrian-aged Elbrook Formation, which is comprised of laminated to thick-bedded dolomite, thin- to medium-bedded limestone, and dolomitic platy shale and siltstone (Figure 3). The strike of bedrock in the vicinity of the site is reported to be approximately 110°. Within a sinkhole located approximately 250 feet southwest of SWMU-40/71, bedrock was observed to dip approximately 10 to 30 degrees to the southwest.

The bedrock subsurface in the vicinity of SWMU-40/71 is highly karstified, with numerous large sinkholes and sinking streams present. With the local abundance of sinking streams, well-developed cave systems should be expected through which groundwater can travel very rapidly, both vertically and laterally.

This condition is evidenced locally in the large sinkhole approximately 200 feet east of SWMU-40/71, in which SWMU-17 is located. A surface stream sinks into the karst subsurface in the southwestern edge of that sinkhole, and its drainage has been positively dye-traced to a spring on the New River approximately 4600 feet to the west of SWMU-40/71 (ES 1994, Parsons 1996). In that study, the dye traveled a distance of 4,800 feet in approximately 24 hours, indicating the presence of an open-flow karst conduit beneath the vicinity of SWMU-40/71. The spatial relationship between the dye injection point and the observed outflow at the river suggests a strike-oriented flow pathway. This is supported by the shape and distribution of local sinkholes, suggesting that local karstification may be strongly influenced by the strike of the lithologic bedding.

3. Resistivity Imaging

Resistivity imaging provides cross-sectional images of the resistance to electric current. Electrical resistivity is a fundamental parameter of the material that describes how easily the material can transmit electrical current. High values of resistivity imply that the material is very resistant to the flow of electricity; low values of resistivity imply that the material transmits electrical current very easily.

The primary factors affecting the resistivity of earth materials are porosity, water saturation, clay content, and ionic strength of the pore water. In general, the minerals making up soils and rock do not readily conduct electric current and thus most of the current flow takes place through the material's pore water. The relatively high levels of pore water in soils and other unconsolidated materials tend to give low resistivity values for the shallow subsurface. Where the levels of pore water in soils and other unconsolidated materials are low, resistivity values tend to be high in the shallow subsurface.

3.1. Principals of Resistivity

Experiments by Gorge Ohm in the early 19th century revealed the empirical relationship between the current flowing through a material and the potential required to drive that current. This relationship is described by

$$V = IR$$

where V is voltage in volts, I is the current in amperes, and R is the proportionality constant. Rearranging the equation to

$$\frac{V}{I} = R$$

gives resistance with the units of volts divided by amperes, or ohms.

The resistance of a material is dependent not only on the property of the material but also the geometry of the material. Specifically, a longer travel path for the current or smaller cross-

sectional area would cause the resistance to increase. The geometry-independent property used to quantify the flow of electric current through a material is resistivity, given by

$$\rho = \frac{RA}{L}$$

where ρ is the resistivity, R is the resistance, A is the cross-sectional area through which the current flows, and L is the length of the current flow path. With all length units expressed as meters, the units associated with resistivity are ohm - meters (ohm - m).

3.2. Field Methods

For any two-dimensional resistivity survey, a series of electrodes is placed in the ground in a straight line with a uniform spacing between electrodes. Resistivity measurements are accomplished by applying an electric current into the ground via two electrodes, and simultaneously measuring the potential at two other electrodes. Numerous configurations (or arrays) of electrode placement are commonly employed, each with unique data characteristics. For this study, data were collected using the dipole-dipole array and the pole-dipole array. The dipole-dipole array provides data of significantly higher resolution than the pole-dipole array, while the pole-dipole array provides data to a greater depth.

For the dipole-dipole array, a current is applied between to two electrodes (current dipole) positioned a predetermined distance apart (distance *a*). The voltage across two other electrodes (potential dipole) is measured simultaneously with the applied current. The electrodes in each dipole are always spaced distance *a* apart and the distance between the current dipole and the voltage dipole is always a multiple of *a* ($n \bullet a$). In the pole-dipole array, an additional electrode (the remote electrode) is placed a large distance from the line of electrodes. A current is applied between the remote electrode and one within the main line of electrodes. The latter is called the local current electrode. The voltage is measured across two other electrodes placed a distance *a* apart. The distance between the local current electrode and the voltage electrodes is always a multiple of *a* ($n \bullet a$). To obtain apparent resistivity values, the voltage and current measurements are input into the following formula for dipole-dipole surveys

$$\rho = 2\pi(n+1)\cdot(n+2)\cdot a \cdot \frac{V}{I}$$

and the following formula for the pole-dipole array:

$$\rho = 2\pi a \cdot n(n+1)\frac{V}{I}$$

Resistivity data were collected using a Tigre® 64 computerized resistivity system manufactured by Allied Associates, Ltd in Great Britain. The resistivity meter was connected via a multi-conductor cable to electrodes placed in the ground. Measurements were initiated at one end of the line and incrementally moved through the electrodes until readings had been taken at every

position along the line. The value of *n* was then increased to add additional resistivity readings at greater depths in the subsurface.

Data from two resistivity lines were collected at the site. Line 1 was located just north of SWMU-40/71 oriented in an east-west direction, and Line 2 was located just west of SWMU-40/71 oriented in a northeast-southwest direction (Figure 4).

Each resistivity line employed a spacing of five meters (16.4 feet) between electrodes. The electrodes were assigned a unique identifier that consisted of the line number followed by a dash and the electrode number. For example, the first electrode on Line 1 was identified as 1-1, the first electrode on Line 2 as 2-1, etc. The elevation of each electrode was taken from the surface topography data in the site plans provided by URS (CAD file entitled "40-71 area only.dwg") so that the resulting resistivity sections would include the local topographic relief. The elevation information was also used in the inversion modeling process as changes in elevation influence the inversion results.

3.3. Inversion Modeling

The resistivity measurements on a section are called apparent resistivities. They may differ from the actual resistivities because the measured data may be affected by passage through inhomogeneous materials and the distance of travel through the media. Therefore, linear inversion techniques were applied to the data using RES2DINV inversion modeling software. Linear inversion modeling fits the measured data in the resistivity section to an earth model that may represent the actual resistivities in the section. The inversion modeling is completed by calculating apparent resistivity from the earth model for comparison to the measured data. If the comparison is within reasonable limits, the earth model can be accepted as an approximation of subsurface conditions. Details of the inversion process may be found in Lines and Treitel (1984), Loke and Barker (1995), and Loke and Barker (1996).

4. Resistivity Results

Because the dipole-dipole array generates a model of higher resolution than that of the pole-dipole array, results of the dipole-dipole array will be discussed first.

4.1. Line 1

The resulting section for Line 1 illustrates a shallow zone of low resistivity values between electrodes 1-32 and 1-56 (Figure 5). This zone is coincident with the area of backfill observed on the ground surface and in geophysical interpretations from previous studies at the site. Monitoring well 40MW2 is graphically projected onto the section for Line 1, although it is located approximately 26 feet north of Line 1.

Landfill materials and leachate typically exhibit resistivity values that are significantly lower than natural earth materials. Two zones of abnormally low resistivity values are observed in the central portion of the line, with values as low as 20 Ohm-meters. The shallower of these two anomalies occurs at a depth of approximately 60 feet, and is located beneath the area between electrodes 1-32 and 1-35. The deeper anomaly occurs at a depth of approximately 100 feet, and is located beneath the area between electrodes 1-39 and 1-43.

Leachate from leaking landfills typically results in vertically or laterally extensive zones of abnormally low resistivity values extending from the landfill area. The unusually low resistivity values seen in Line 1 may suggest the presence of contamination associated with the former disposal area(s). The shape and distribution of these anomalies also suggest that they may be located within karst features or fracture zones.

Of additional note is that the Radford North USGS 7.5-minute topographic quadrangle presented in Figure 2, which illustrates the surface topography prior to the creation of SWMU-40/71, indicates the prior existence of an enclosed depression (i.e. sinkhole) immediately beneath the current location of SWMU-40/71. Based on this information, it is reasonable to interpret that one or both of the anomalies in that portion of Line 1 likely represent(s) karst solutional features related to that buried sinkhole. This possible interpretation is supported by previous soil boring investigations conducted by URS (2004), which showed a significant increase in depth to bedrock in this area in boring 40SB4. A bedrock pinnacle was also noted nearby in boring 40SB14. These borings are located approximately 60 feet and 20 feet south of Line 1, respectively.

In the western portion of Line 1, numerous small, relatively shallow low-resistivity features are observed which likely represent soil-filled karst features. These features are at a higher elevation than SWMU-40/71, and therefore would not be suitable locations for the placement of monitoring wells. However, a vertically extensive low-resistivity zone is observed beneath electrodes 1-17 to 1-20 which may represent a fracture zone or a larger and deeper karst feature.

The pole-dipole data for Line 1 provided data to a depth of approximately 350 feet. Its characteristics generally mimic those of the dipole-dipole data, with the exception of the anomaly just described. With the added depth of data provided, the resistivity contour values enclose around that anomaly beneath the vicinity of 1-18, rendering it more characteristic of a partially soil- or water-filled karst feature rather than a fracture zone. This anomaly is at an approximate elevation of 1835 feet, approximately 60 to 70 feet lower than the buried fill materials in SWMU-40/71. Two deeper low-resistivity anomalies are observed at the bottom of the section. These occur at an approximate elevation of 1650 feet MSL and are therefore below the level of the New River. As such, they are not considered relevant to this study.

4.2. Line 2

The results for Line 2 reveal the complex and highly varied nature of the subsurface beneath the site, bearing characteristics typical of highly fractured and highly karstified terrain (Figure 6). Numerous anomalies are observed in the section for Line 2, with possible fracture zones

identified beneath the vicinities of electrodes 2-13, 2-23, and 2-48 and possible karst features identified beneath electrodes 2-13, 2-38 and 2-48.

The interpreted karst feature beneath electrode 2-38 is at an approximate elevation of 1830 feet, consistent with the elevation of the anomaly previously described beneath electrode 1-18, and also bears the characteristics of a partially soil- or water-filled karst feature. Due to the similarities in elevation and character of these two anomalies, it is possible that they represent a continuation of a karst conduit between those two locations.

As with the pole-dipole dataset for Line 1, the pole-dipole section for Line 2 revealed similar characteristics as the dipole-dipole data, but provided greater depth.

5. Existing Monitoring Wells

The locations of existing monitoring wells in the immediate vicinity of SWMU-40/71 – as indicated in CAD drawings provided to ATS by URS – are presented in Figure 3, and are identified as 40MW2, 40MW3 and 40MW4. Because of their proximity to Lines 1 and 2, monitoring wells 40MW2 and 40MW3 were plotted graphically onto the resistivity sections so that their proximity to resistivity anomalies could be evaluated. It should be noted, however, that the map in Figure 3 indicates that 40MW3 is located between electrodes 2-4 and 2-5, while in the field, 40MW3 is located approximately 40 feet northwest of that location.

6. Recommendations for Additional Monitoring Wells

The resistivity data collected to the north and to the west of SWMU-40/71 reveals that the bedrock subsurface beneath the site is of a highly varied and complex nature, and is characterized by numerous low-resistivity anomalies which are consistent with bedrock fracture or fault zones and karst-related dissolution features. A total of seven resistivity anomalies have been specifically identified in Figures 5 and 6 as interpreted fracture zones and/or karst features. Possible karst features which could be expected beneath the site may include completely soil-filled cavernous voids, laterally extensive open-air cavernous voids (which are at least partially filled with highly conductive soils and/or water), and open-flowing bedrock stream conduits as would be expected to exist in association with the sinking stream located just east of SWMU-40/71 (at the south end of SWMU-17).

Each of these areas may represent possible locations for intercepting groundwater through the installation of a monitoring well. The selection of monitoring well locations should take into account the 3-dimensional heterogeneity of the karst subsurface, with special consideration given to the fact that groundwater migration through potentially open-flow karst from the vicinity of SWMU-40/71 is not likely to follow normally intuitive parameters.

The fact that a positive dye trace was conducted from the sinkhole at SWMU-17 (on the east side of SWMU-40/71) almost due west to the New River reveals that an open-flow karst conduit exists beneath the vicinity of SWMU-40/71. Given this information, combined with the fact that SWMU-40/71 was evidently constructed immediately above a sinkhole, it is reasonable to

expect that groundwater migration from the vicinity of SWMU-40/71 would be primarily to the west, generally along strike, and primarily through relatively well-developed karst conduits.

As such, several recommendations for additional monitoring well locations have been provided. The locations are listed in the table below, and refer to the electrode flag numbers which were placed in the field:

Line 1	Line 2
1-18.5	2-13
1-33.5	2-23
1-41	2-38
	2-48

At a minimum, we recommend that a monitoring well be placed along Line 1, either at electrode 1-33.5 (i.e. halfway between 1-33 and 1-34) or at electrode 1-41. If the direction of groundwater migration from SWMU-40/71 were at all to the north, then a monitoring well placed at either of these locations would be likely to intercept karst drainage from the probable sinkhole buried beneath SWMU-40/71, and therefore likely to bear any dissolved constituents associated with the disposed material. If the location at electrode 1-33.5 is drilled, it should be completed to a minimum depth of 100 feet. If the location at 1-41 is drilled, it should be completed to a minimum depth of 130 feet.

Based on the resistivity results and the body of data for the site, monitoring wells drilled on Line 2 at electrodes 2-23, 2-38, and 2-48 would be most likely to intercept westerly groundwater flow from SWMU-40/71. The low-resistivity anomaly beneath 2-13 would likely intercept groundwater, but drilling this location would not be necessary if a monitoring well is placed at 1-41 and/or 1-33.5.

Due to terrain or other site restraints present at some of the suggested drilling targets, it may be desirable to drill targets not listed above, including locations which may not lie directly on the two resistivity lines. Doing so may still intercept groundwater and achieve the desired results; however, this would be at your discretion.

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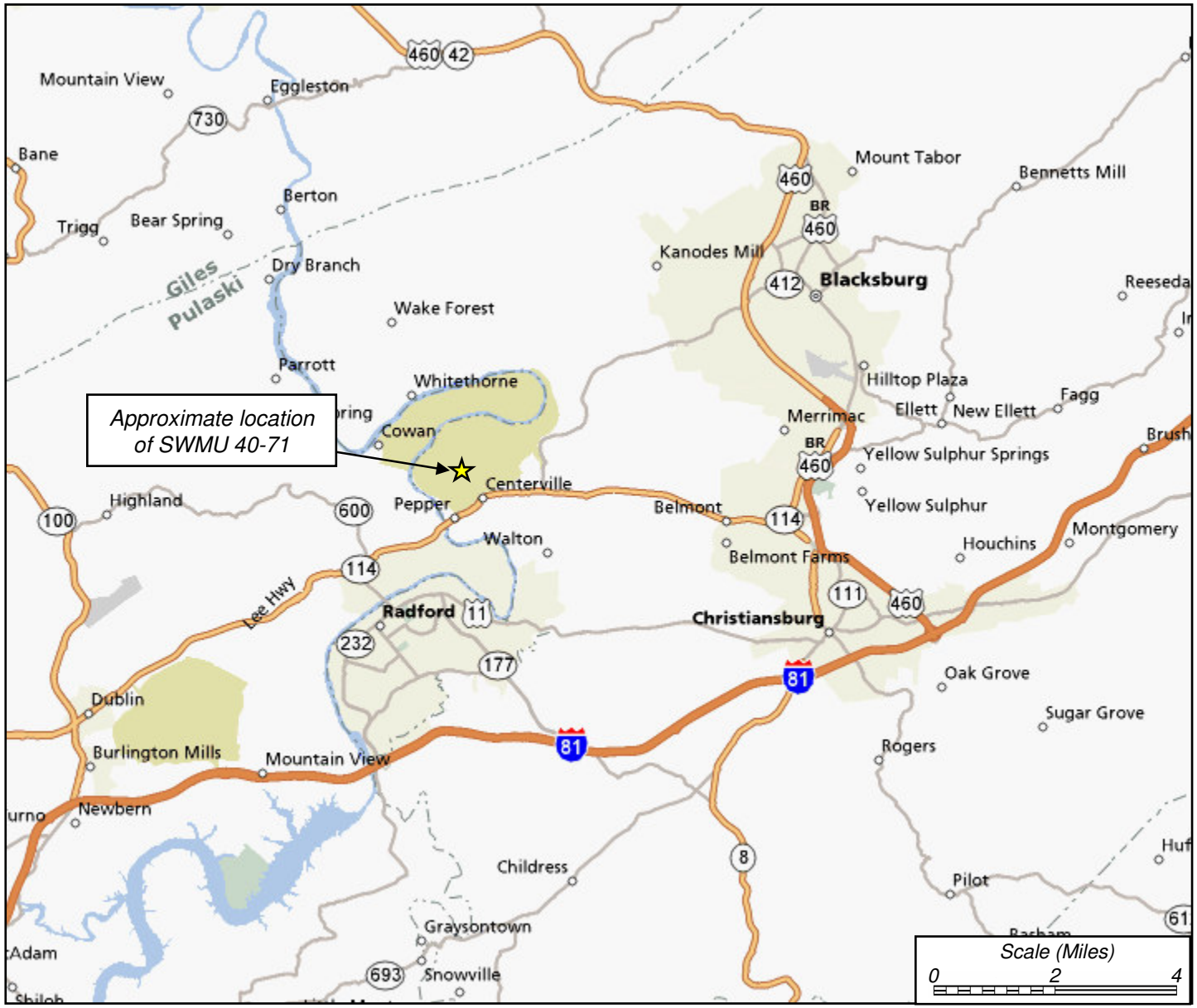
Figures



Report Title: *Resistivity Imaging Survey for the RAAP SWMU 40-71, Radford, Virginia*	
File Name: *RAAP SWMU 40-71 Res Is.ppt*	
Date: *12/13/06*	Draftsman: *CMP*
ATS Project Number:	*P06-05*

Figure 1. Portion of road map illustrating the approximate location of SWMU 40-71 and other local features.

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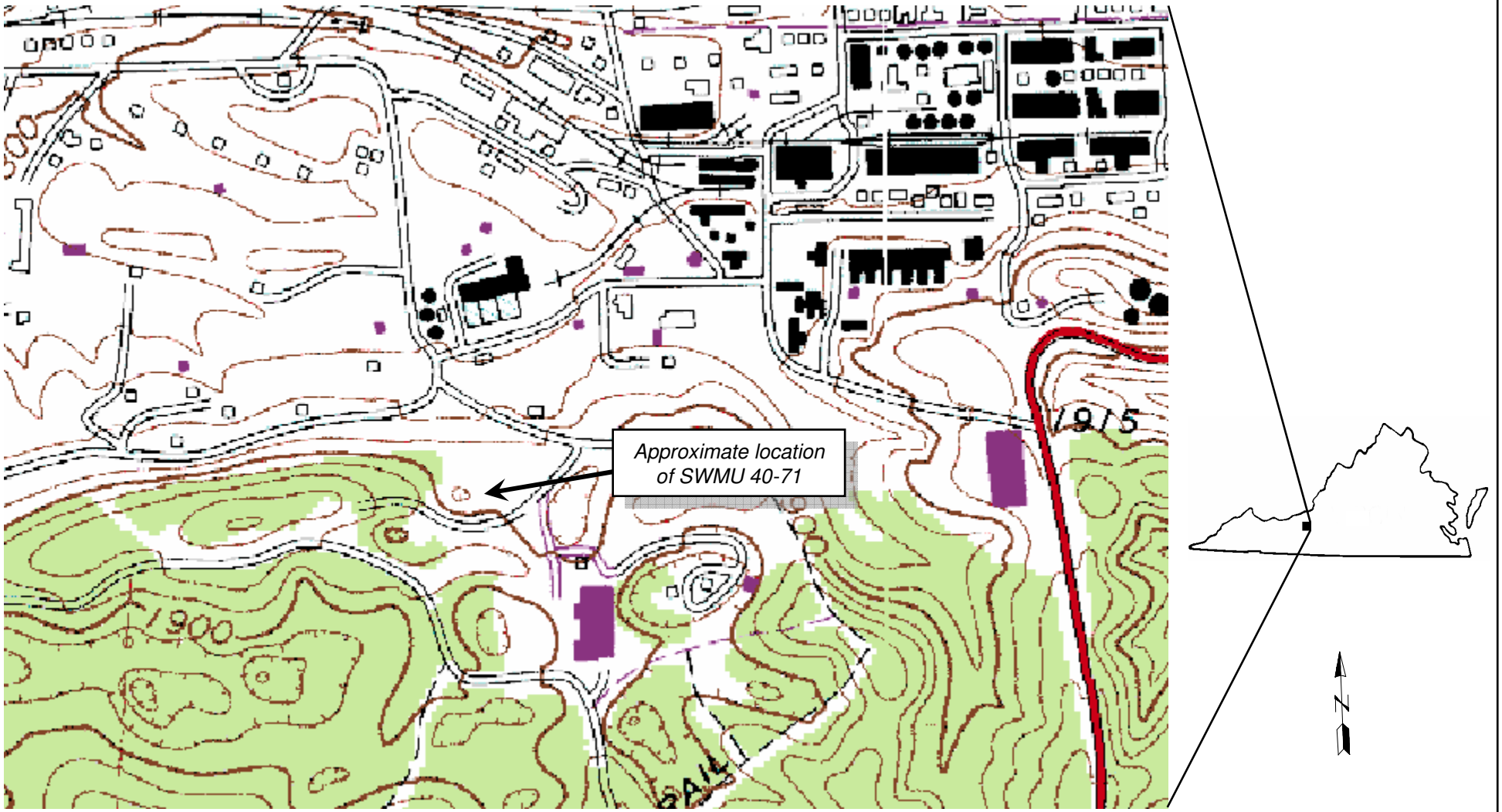

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Figure 2. Portion of the Radford North USGS 7.5-minute topographic quadrangle illustrating the approximate location of SWMU 40-71 and other local features. (Note the sinkhole which evidently existed prior to the creation of SWMU 40-71).

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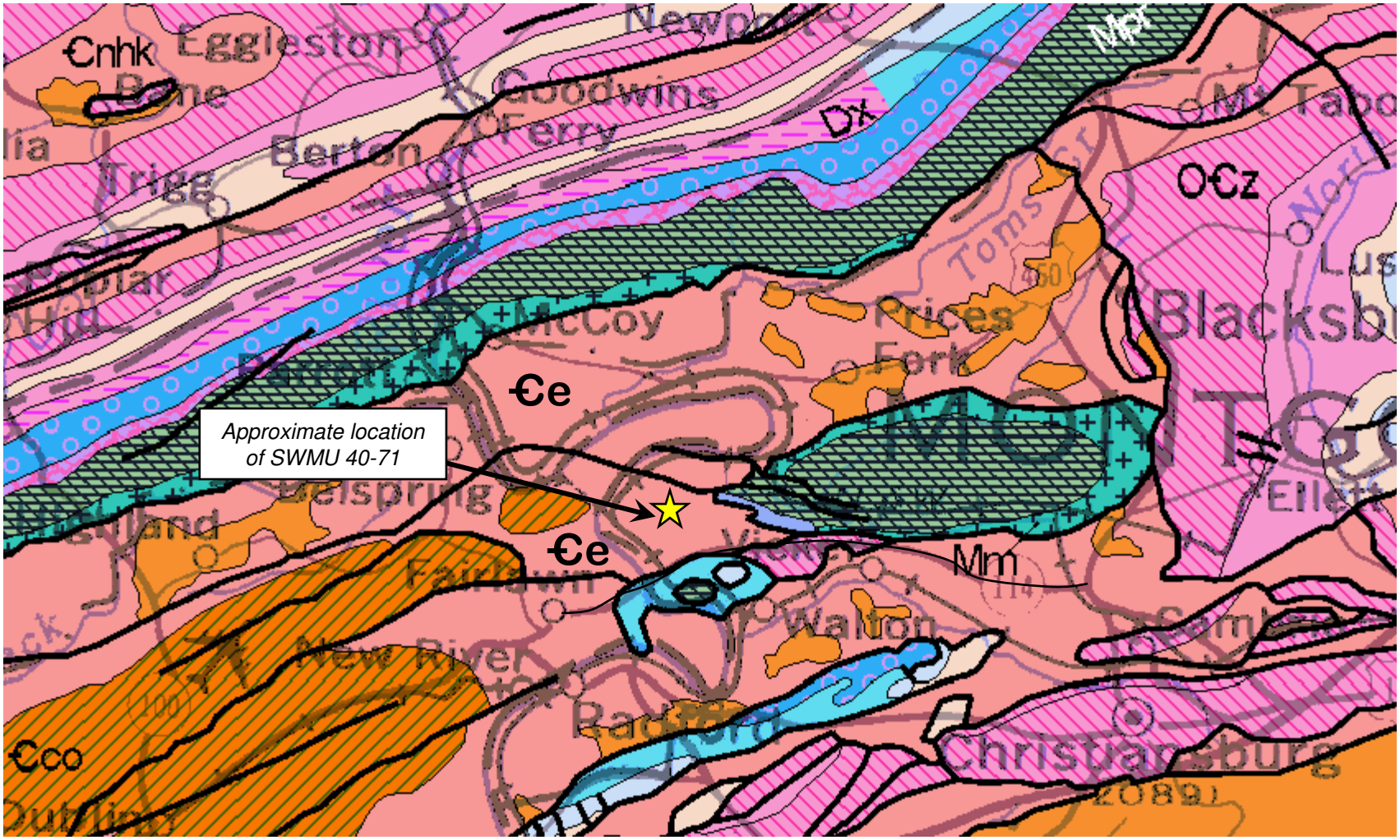

Map Scale 1:500,000
1 inch = Approximately 8 miles

Cе = ***Elbrook Formation:*** *Dolostone, Limestone, Dolomitic Platy Shale and Siltstone*

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Figure 3. Portion of the Geologic Map of Virginia illustrating mapped geologic units in the vicinity of the site. (Virginia Division of Mineral Resources, 1993)

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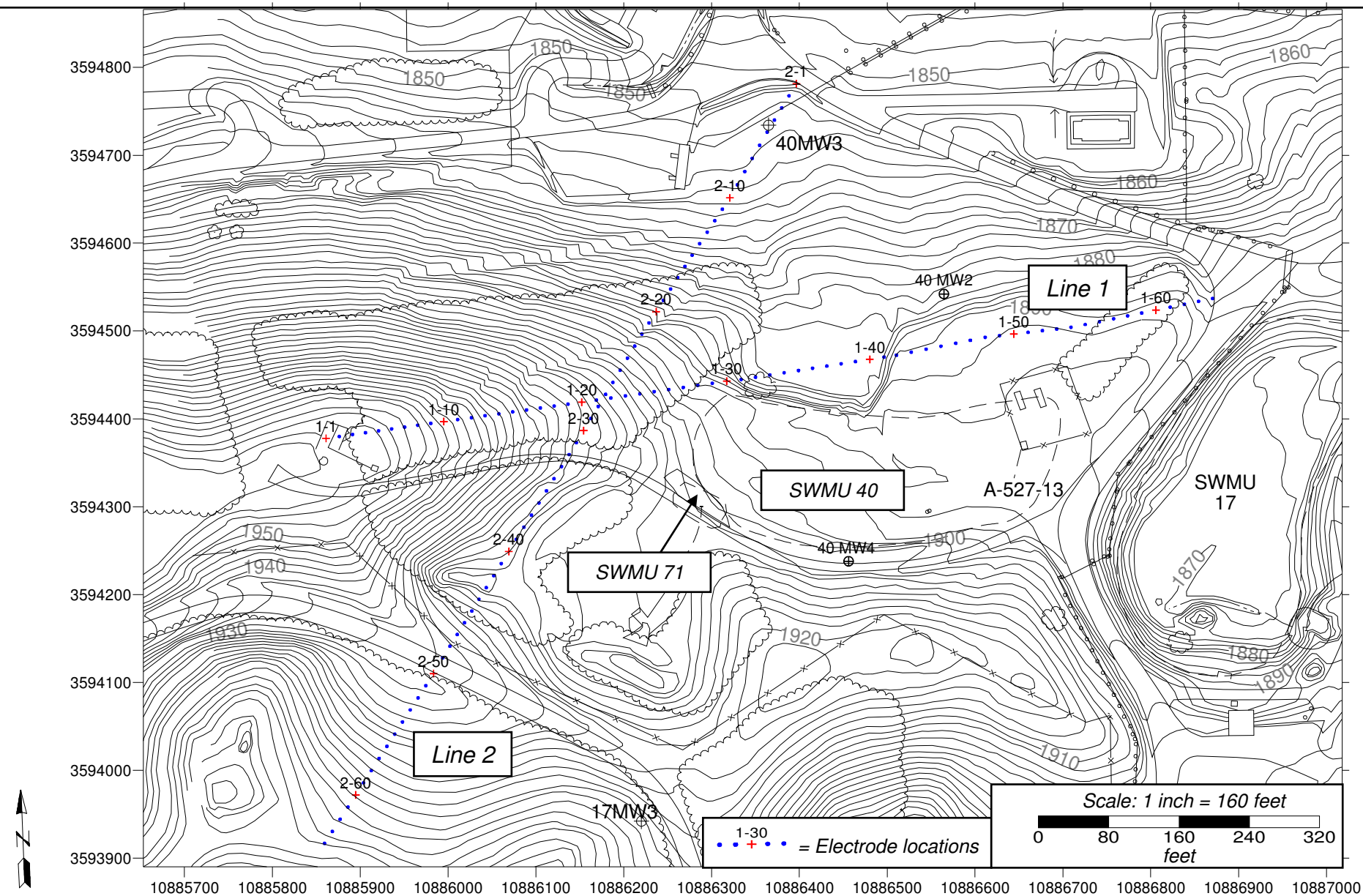

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File Name: *RAAP SWMU 40-71 Res ls.ppt*	
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Figure 4. Portion of site layout illustrating the location of SWMU 40-71, the locations of resistivity electrodes and other site features.

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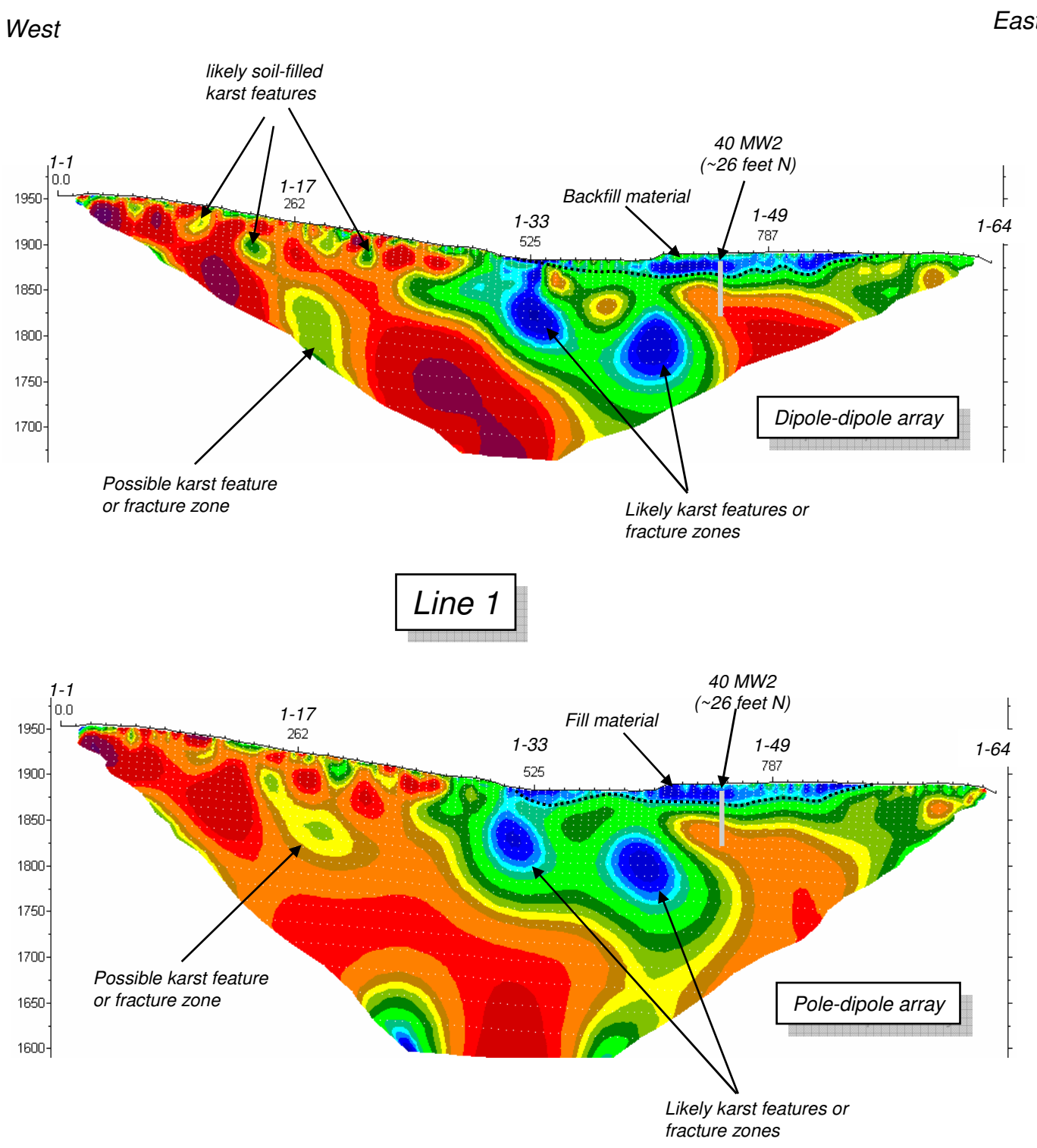

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File Name: *RAAP SWMU 40-71 Res pt.ppt*	
Date: *12/14/06*	Draftsman: *CMP*
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Figure 5. Results of Line 1, illustrating data from the pole-dipole array and the dipole-dipole array and recommended monitoring well locations.

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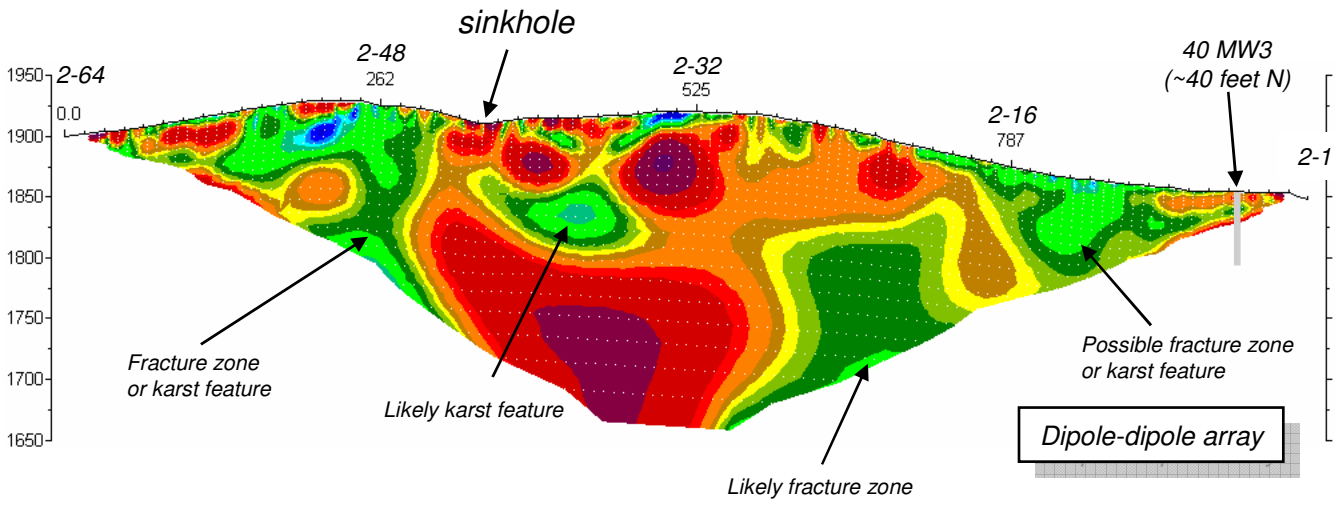
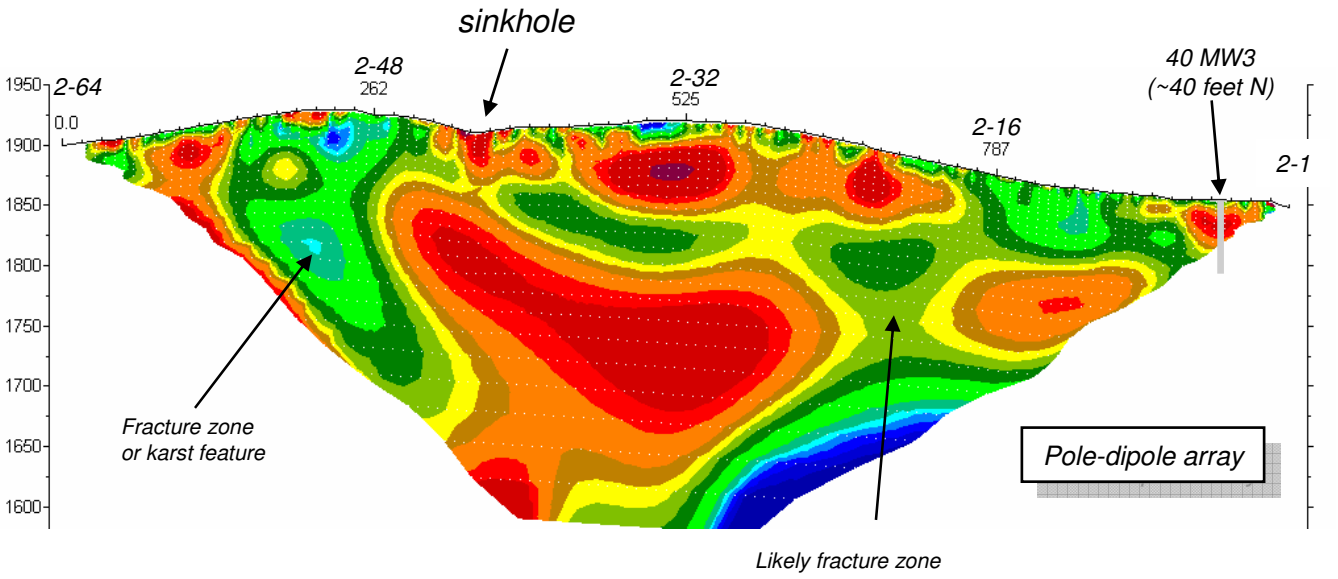
Southwest

Northeast



Line 2



Resistivity Scale in Ohm-meters

0.00 37.5 62.5 100 250 400 750 2500

Scale: 1 inch = 160 feet

Elevations are in Feet Above MSL

Report Title: *Resistivity Imaging Survey for the RAAP SWMU 40-71, Radford, Virginia*	
File Name: *RAAP SWMU 40-71 Res pt.ppt*	
Date: *12/14/06*	Draftsman: *CMP*
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Figure 6. Results of Line 2, illustrating data from the pole-dipole array and the dipole-dipole array and recommended monitoring well locations.

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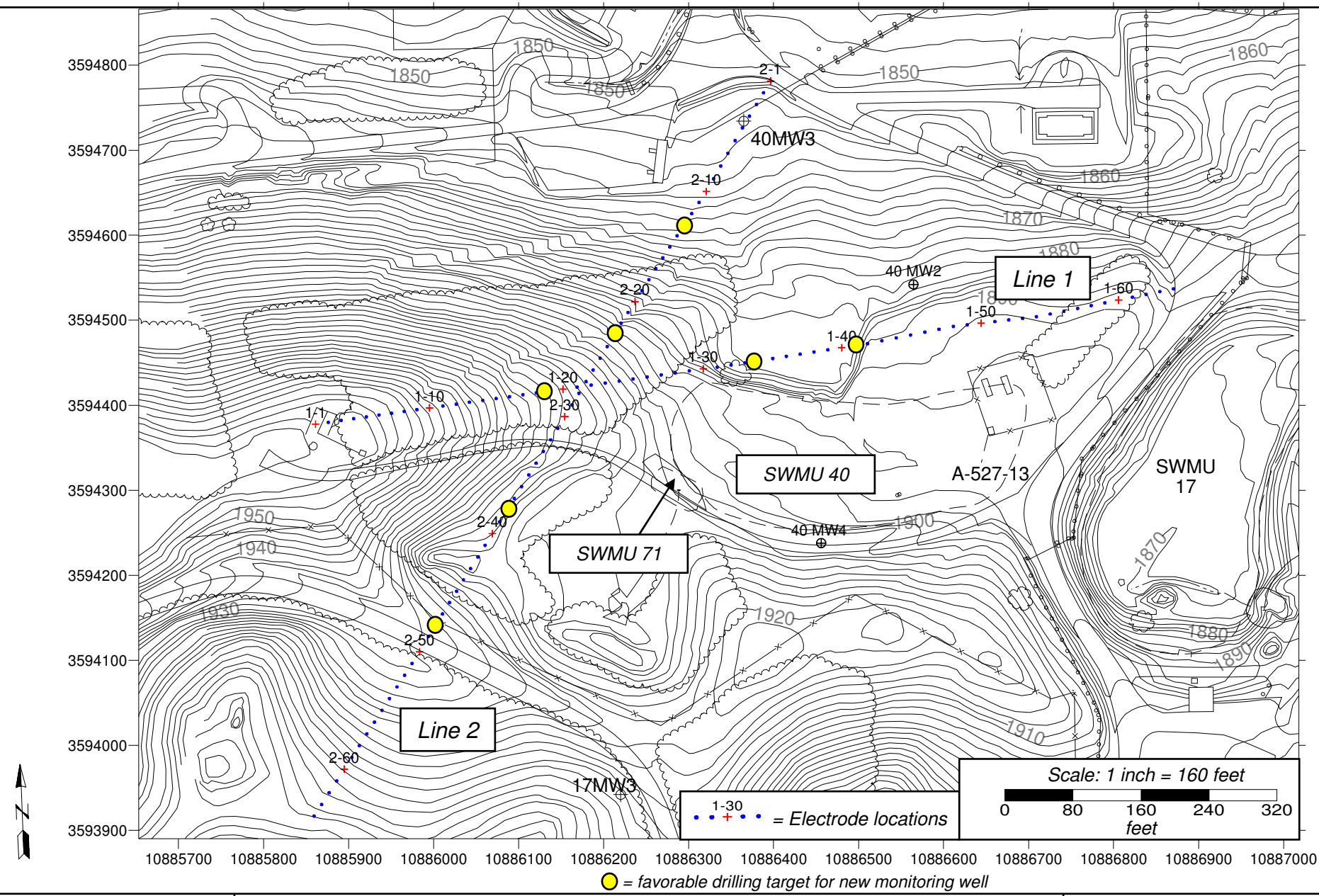

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Figure 7. Portion of site layout illustrating electrode flag locations of all favorable drilling targets for new monitoring wells based on interpretation of the resistivity data.

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APPENDIX E

HUMAN HEALTH RISK ASSESSMENT

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APPENDIX E.1

SWMU 40 HHRA

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Table E.1-1
Selection of Exposure Pathways - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface Soil	Surface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
		Air	Ambient Air Above Surface Soil (Particulates and Vapors)	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest subsurface soil from the site since maintenance does not include excavation.
						Dermal Absorption	None	Receptor is not likely to come in contact with subsurface soil from the site since maintenance does not include excavation.
		Air	Ambient Air Above Subsurface Soil (Particulates and Vapors)	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale particulates and vapors from ambient air above the subsurface soil since maintenance activities do not include excavation.
	Groundwater [1]	Groundwater	Groundwater	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest groundwater from the site during maintenance activities.
						Dermal Absorption	None	Receptor is not likely to contact groundwater from the site during maintenance activities.
		Air	Upward Migration of Vapors from Groundwater (Outdoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.
			Upward Migration of Vapors from Groundwater (Indoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
			Vapors while Showering	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
Future	Surface Soil	Surface Soil	Surface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
				Commerical/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil while working on site.
						Dermal Absorption	Quant	Receptor could contact surface soil while working on site.
				Construction Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site during construction activities.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site during construction activities.
				Resident	Child	Ingestion	Quant	Receptor could ingest surface soil while living on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while living on site.
					Adult	Ingestion	Quant	Receptor could ingest surface soil while living on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while living on site.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Ambient Air Above Surface Soil (Particulates and Vapors)	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil while working on site.
				Commerical/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil while working on site.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil while working on site.
				Resident	Child	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil while living on site.
					Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil while living on site.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.

Table E.1-1
Selection of Exposure Pathways - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
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Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Surface Soil Cont.	Air Cont.	Upward Migration of Vapors from Soil (Indoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Commercial/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale VOCs from soil via vapor intrusion into building.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Resident	Adult	Inhalation	Quant	Receptor could inhale VOCs from soil via vapor intrusion into residence.
					Child	Inhalation	Quant	Receptor could to inhale VOCs from soil via vapor intrusion into residence.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident. [1]
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction activities while conducting routine maintenance activities.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction activities while conducting routine maintenance activities.
				Commerical/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
						Dermal Absorption	Quant	Receptor could contact subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
				Construction Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil from the site while during construction activities.
						Dermal Absorption	Quant	Receptor could come into contact with subsurface soil from the site during construction activities.
				Resident	Child	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a residence.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction of a residence.
					Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a residence.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction of a residence.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Ambient Air Above Subsurface Soil (Particulates and Vapors)	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the subsurface soil when mixed with surface soil from construction activities while conducting routine maintenance activities.
				Commerical/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the subsurface soil during construction activities.
				Resident	Child	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the subsurface soil when mixed with surface soil from construction of a residence.
					Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the subsurface soil when mixed with surface soil from construction of a residence.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.

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Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Subsurface Soil Cont.	Air Cont.	Upward Migration of Vapors from Soil (Indoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Commercial/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale VOCs from soil via vapor intrusion into building.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Resident	Adult	Inhalation	Quant	Receptor could inhale VOCs from soil via vapor intrusion into residence.
					Child	Inhalation	Quant	Receptor could inhale VOCs from soil via vapor intrusion into residence.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
	Groundwater [1]	Groundwater	Groundwater	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest groundwater from the site during maintenance activities.
						Dermal Absorption	None	Receptor is not likely to contact groundwater from the site during maintenance activities.
				Commercial/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply for industrial process.
				Construction Worker	Adult	Ingestion	None	Due to the depth to groundwater (approximately 90-100 ft bgs), the receptor is not likely to ingest groundwater during excavation activities.
						Dermal Absorption	None	Due to the depth to groundwater (approximately 90-100 ft bgs), the receptor is not likely to contact groundwater during excavation activities.
				Resident	Adult	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply.
					Child	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to groundwater. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Upward Migration of Vapors from Groundwater (Outdoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.
				Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale vapors that migrated upward from groundwater to during excavation activities.
				Resident	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.
					Child	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.
					Child/Adult	Inhalation	None	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to groundwater. The non-cancer hazard evaluations are treated separately for child and adult resident.[2]
			Upward Migration of Vapors from Groundwater (Indoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Commercial/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale VOCs from groundwater via vapor intrusion into building.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Resident	Adult	Inhalation	Quant	Receptor could inhale VOCs from groundwater via vapor intrusion into residence.
					Child	Inhalation	Quant	Receptor could inhale VOCs from groundwater via vapor intrusion into residence.

Table E.1-1
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Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Groundwater Cont.	Air Cont.	Upward Migration of Vapors from Groundwater (Indoors) Cont.	Resident Cont.	Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to groundwater. The non-cancer hazard evaluations are treated separately for child and adult resident.[2]
			Vapors while Showering	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
				Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
				Resident	Adult	Inhalation	Quant	Receptor could inhale vapors from groundwater while showering.
					Child	Inhalation	None	Receptor is assumed not to shower.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to groundwater. Since the shower scenario applies only to the adult resident, the lifetime resident exposure will be equivalent to that of the adult resident.[2]

Notes:
[1] Groundwater from the surface aquifer is not currently used at the sites for potable or non-potable water supply.

Table E.1-2.1
SWMU 40 COPC Determination - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Surface Soil		**TAL Metals**															
	7429-90-5	Aluminum	659	28,500	mg/kg	40SB4A	19/19	2.5 - 9.3	28,500	40,041	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.46	1.3	mg/kg	71SB14A	15/18	0.14 - 0.47	1.3	--	3.13	N	40.88	N	IND	N	BSL
	7440-38-2	Arsenic	1.3	55	mg/kg	40SB1A	19/19	0.28 - 0.49	55	15.8	0.426	C	1.91	C	IND	Y	***ARES/IND***
	7440-39-3	Barium	14.6	191	mg/kg	40SB3A	19/19	0.02 - 0.05	191	209	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.24	1.5	mg/kg	40SB4A	19/19	0.01 - 0.03	1.5	1.02	15.64	N	204.4	N	IND	N	BSL
	7440-43-9	Cadmium	0.09	0.75	mg/kg	40SB1A	8/19	0.03 - 0.05	0.75	0.69	3.91	N	51.1	N	IND	N	BSL
	7440-70-2	Calcium	457	26,300	mg/kg	40SB10A	19/19	1.1 - 2.5	26,300	--	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium[1]	4.1	37.6	mg/kg	40SS3	19/19	0.07 - 0.13	37.6	65.3	23.46	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	1.8	13.2	mg/kg	40SB3A	19/19	0.07 - 0.12	13.2	72.3	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	2.1	76	mg/kg	71SB14A	18/19	0.16 - 0.25	76	53.5	312.86	N	4,088	N	IND	N	BSL
	7439-89-6	Iron	1,440	32,000	mg/kg	40SB1A	19/19	1.4 - 2.1	32,000	50,962	5,475	N	71,540	N	IND	Y	**ARES**
	7439-92-1	Lead[2]	3.8	110	mg/kg	71SB14A	19/19	0.14 - 0.29	110	26.8	400	--	750	--	USEPA	N	BSL
	7439-95-4	Magnesium	120	24,400	mg/kg	40SB4A	19/19	0.69 - 2	24,400	--	--	--	156,000	--	RDA	N	BSL
	7439-96-5	Manganese	10.7	894	mg/kg	40SS1	19/19	0.02 - 0.03	894	2,543	156.4	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury[3]	0.042	2.1	mg/kg	40SB1A	18/19	0.017 - 0.039	2.1	0.13	2.300	N	31	N	IND	N	BSL
	7440-02-0	Nickel	4.3	20.9	mg/kg	40SB4A	19/19	0.11 - 0.16	20.9	62.8	156.4	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	89.2	5,240	mg/kg	40SB4A	19/19	4.5 - 14.9	5,240	--	--	--	2,607,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.475	3.3	mg/kg	40SB1A	18/19	0.34 - 0.49	3.3	--	39.11	N	511	N	IND	N	BSL
	7440-22-4	Silver	0.071	0.2	mg/kg	40SB1A	4/19	0.08 - 0.13	0.2	--	39.11	N	511	N	IND	N	BSL
	7440-23-5	Sodium	86.8	370	mg/kg	71SB14A	19/19	28 - 50.1	370	--	--	--	625,700	--	RDA	N	BSL
	7440-28-0	Thallium	0.49	1.3	mg/kg	71SB14A	2/14	0.27 - 0.64	1.3	2.11	0.548	N	7.2	N	IND	Y	**ARES**
	7440-62-2	Vanadium	5.4	56.9	mg/kg	40SB9A	19/19	0.08 - 0.12	56.9	108	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	5.5	148	mg/kg	40SB1A	19/19	0.11 - 0.18	148	202	2,346	N	30,660	N	IND	N	BSL
		Pesticides/PCBs															
	72-55-9	4,4'-DDE	1.8E-03	1.8E-03	mg/kg	40SB10A	1/17	0.0004 - 0.0004	1.8E-03	--	1.9E+00	C	8.4E+00	C	IND	N	BSL
	50-29-3	4,4'-DDT	7.7E-03	7.7E-03	mg/kg	40SS4	1/17	0.00039 - 0.00039	7.7E-03	--	1.9E+00	C	8.4E+00	C	IND	N	BSL
	309-00-2	Aldrin	2.1E-03	5.1E-03	mg/kg	40SS4	2/17	0.00017 - 0.00017	5.1E-03	--	3.8E-02	C	1.7E-01	C	IND	N	BSL
	5103-71-9	alpha-Chlordane[4]	4.9E-04	3.2E-03	mg/kg	40SB10A	3/17	0.00022 - 0.00022	3.2E-03	--	1.8E+00	C	8.2E+00	C	IND	N	BSL
	319-85-7	beta-BHC	2.1E-03	1.2E-02	mg/kg	40SB12A	5/17	0.00028 - 0.00028	1.2E-02	--	3.5E-01	C	1.6E+00	C	IND	N	BSL
	1031-07-8	Endosulfan Sulfate[5]	2.9E-02	2.9E-02	mg/kg	40SS4	1/17	0.0004 - 0.0004	2.9E-02	--	4.7E+01	N	6.1E+02	N	IND	N	BSL
	72-20-8	Endrin	3.9E-03	3.9E-03	mg/kg	40SS4	1/17	0.00035 - 0.00035	3.9E-03	--	2.3E+00	N	3.1E+01	N	IND	N	BSL
	53494-70-5	Endrin Ketone[6]	2.4E-02	2.4E-02	mg/kg	40SS4	1/17	0.00039 - 0.00039	2.4E-02	--	2.3E+00	N	3.1E+01	N	IND	N	BSL
	58-89-9	gamma-BHC (Lindane)	5.5E-04	1.1E-02	mg/kg	40SS4	2/17	0.00022 - 0.00022	1.1E-02	--	4.9E-01	C	2.2E+00	C	IND	N	BSL
	5103-74-2	gamma-Chlordane[4]	7.6E-03	7.6E-03	mg/kg	40SS4	1/17	0.00035 - 0.00035	7.6E-03	--	1.8E+00	C	8.2E+00	C	IND	N	BSL
	72-43-5	Methoxychlor	4.3E-02	4.3E-02	mg/kg	40SS4	1/17	0.0014 - 0.0014	4.3E-02	--	3.9E+01	N	5.1E+02	N	IND	N	BSL
	12672-29-6	Aroclor 1248	1.9E-01	1.9E-01	mg/kg	71SB15A DUP AVG	1/32	0.0052 - 0.0091	1.9E-01	--	3.2E-01	C	1.4E+00	C	IND	N	BSL
	11097-69-1	Aroclor 1254[7]	2.0E-02	2.1E+00	mg/kg	40SS1	28/32	0.0085 - 0.0098	2.1E+00	--	1.6E-01	N	1.4E+00	C	IND	Y	***ARES/IND***
	11096-82-5	Aroclor 1260	1.3E-02	6.2E-01	mg/kg	40SS7	11/32	0.0062 - 0.0092	6.2E-01	--	3.2E-01	C	1.4E+00	C	IND	Y	**ARES**
		TCL VOCs															
	120-82-1	1,2,4-Trichlorobenzene	7.0E-04	7.0E-04	mg/kg	40SB12A	1/17	0.0004 - 0.001	7.0E-04	--	7.8E+01	N	1.0E+03	N	IND	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	4.0E-04	4.0E-04	mg/kg	40SB12A	1/17	0.0002 - 0.0007	4.0E-04	--	2.0E-01	C	3.6E+00	C	IND	N	BSL
	95-50-1	1,2-Dichlorobenzene	4.0E-04	8.0E-04	mg/kg	40SS5	2/17	0.0002 - 0.0004	8.0E-04	--	7.0E+02	N	9.2E+03	N	IND	N	BSL
	541-73-1	1,3-Dichlorobenzene	3.0E-04	9.0E-04	mg/kg	40SS5	2/17	0.0002 - 0.0006	9.0E-04	--	2.3E+01	N	3.1E+02	N	IND	N	BSL
	106-46-7	1,4-Dichlorobenzene	5.0E-04	1.0E-03	mg/kg	40SS5	3/17	0.0002 - 0.0006	1.0E-03	--	2.7E+01	C	1.2E+02	C	IND	N	BSL
	78-93-3	2-Butanone	6.0E-03	4.0E-02	mg/kg	40SS3	8/17	0.001 - 0.003	4.0E-02	--	4.7E+03	N	6.1E+04	N	IND	N	BSL
	591-78-6	2-Hexanone	2.0E-03	2.0E-03	mg/kg	40SB12A	1/17	0.0005 - 0.001	2.0E-03	--	--	--	--	--	--	Y	NSV
	108-10-1	4-Methyl-2-Pentanone	3.0E-03	3.1E-02	mg/kg	40SB10A	10/17	0.0005 - 0.001	3.1E-02	--	--	--	--	--	--	Y	NSV
	67-64-1	Acetone	1.1E-02	4.6E-01	mg/kg	40SS3	16/17	0.0009 - 0.002	4.6E-01	--	7.0E+03	N	9.2E+04	N	IND	N	BSL
	71-43-2	Benzene	8.0E-04	6.0E-03	mg/kg	40SB10A	3/17	0.0004 - 0.001	6.0E-03	--	1.2E+01	C	5.2E+01	C	IND	N	BSL
	74-83-9	Bromomethane	3.0E-03	3.0E-03	mg/kg	40SB12A	1/17	0.0009 - 0.002	3.0E-03	--	1.1E+01	N	1.4E+02	N	IND	N	BSL
	75-15-0	Carbon Disulfide	1.0E-03	4.0E-03	mg/kg	40SS2	8/17	0.0005 - 0.001	4.0E-03	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	108-90-7	Chlorobenzene	4.0E-04	4.0E-04	mg/kg	40SB5A	1/17	0.0002 - 0.0006	4.0E-04	--	1.6E+02	N	2.0E+03	N	IND	N	BSL
	74-87-3	Chloromethane	1.0E-03	3.0E-03	mg/kg	40SS5	2/17	0.0009 - 0.002	3.0E-03	--	--	--	--	--	--	Y	NSV
	110-82-7	Cyclohexane	3.0E-03	3.0E-03	mg/kg	40SB10A	2/17	0.0004 - 0.001	3.0E-03	--	--	--	--	--	--	Y	NSV
	75-71-8	Dichlorodifluoromethane	1.0E-03	3.0E-03	mg/kg	40SS5	4/17	0.0004 - 0.001	3.0E-03	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	100-41-4	Ethylbenzene	7.0E-04	1.7E-02	mg/kg	40SB10A	9/17	0.0004 - 0.0009	1.7E-02	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	98-82-8	Isopropylbenzene	3.0E-03	3.0E-03	mg/kg	40SB10A	1/17	0.006 - 0.017	3.0E-03	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	79-20-9	Methyl Acetate	1.4E-02	1.2E-01	mg/kg	40SS3	7/17	0.0005 - 0.001	1.2E-01	--	7.8E+03	N	1.0E+05	N	IND	N	BSL
	1634-04-4	Methyl Tert-Butyl Ether	2.0E-03	2.0E-03	mg/kg	40SB10A	1/17	0.006 - 0.017	2.0E-03	--	1.6E+02	C	7.2E+02	C	IND	N	BSL
	108-87-2	Methylcyclohexane	1.0E-03	2.7E-02	mg/kg	40SS4	3/17	0.0004 - 0.001	2.7E-02	--	--	--	--	--	--	Y	NSV
	75-09-2	Methylene Chloride	7.0E-04	1.4E-02	mg/kg	40SS2	11/17	0.0005 - 0.001	1.4E-02	--	8.5E+01	C	3.8E+02	C	IND	N	BSL
	100-42-5	Styrene	8.0E-04	2.0E-03	mg/kg	40SS3	5/17	0.0002 - 0.0006	2.0E-03	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	127-18-4	Tetrachloroethene	1.0E-03	1.0E-03	mg/kg	40SB12A	1/17	0.0003 - 0.0009	1.0E-03	--	1.2E+00	C	5.3E+00	C	IND	N	BSL
	108-88-3	Toluene	8.0E-04	1.9E-02	mg/kg	40SS4	17/17	0.0004 - 0.001	1.9E-02	--	6.3E+02	N	8.2E+03	N	IND	N	BSL
	79-01-6	Trichloroethene	6.0E-04	2.2E-02	mg/kg	40SS2	16/17	0.0004 - 0.001	2.2E-02	--	1.6E+00	C	7.2E+00	C	IND	N	BSL
	1330-20-7	Xylenes (Total)	1.0E-03	8.2E-02	mg/kg	40SS4	16/17	0.001 - 0.003	8.2E-02	--	1.6E+03	N	2.0E+04	N	IND	N	BSL

Table E.1-2.1
SWMU 40 COPC Determination - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
		TCL SVOCs															
	91-57-6	2-Methylnaphthalene	4.5E-02	1.4E-01	mg/kg	40SS5	3/17	0.024 - 0.024	1.4E-01	--	3.1E+01	N	4.1E+02	N	IND	N	BSL
	100-52-7	Benzaldehyde	6.6E-02	6.6E-02	mg/kg	40SB1A	1/17	0.039 - 0.039	6.6E-02	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	3.8E-02	2.8E-01	mg/kg	40SS3	14/17	0.032 - 0.032	2.8E-01	--	4.6E+01	C	2.0E+02	C	IND	N	BSL
	105-60-2	Caprolactam	8.0E-01	8.0E-01	mg/kg	40SS2	1/17	0.062 - 0.062	8.0E-01	--	3.9E+03	N	5.1E+04	N	IND	N	BSL
	86-74-8	Carbazole	4.7E-02	2.0E-01	mg/kg	40SS4	2/17	0.029 - 0.029	2.0E-01	--	3.2E+01	C	1.4E+02	C	IND	N	BSL
	84-74-2	Di-n-butylphthalate	9.2E-02	1.4E-01	mg/kg	40SB6A	2/17	0.027 - 0.57	1.4E-01	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	117-84-0	Di-n-octylphthalate	2.6E-02	5.0E-01	mg/kg	40SS3	5/17	0.021 - 0.57	5.0E-01	--	--	--	--	--	--	Y	NSV
	132-64-9	Dibenzofuran	5.2E-02	5.6E-02	mg/kg	40SS5	2/17	0.024 - 0.024	5.6E-02	--	7.8E+00	--	1.0E+02	--	IND	N	BSL
		TCL PAHs															
	83-32-9	Acenaphthene	2.1E-02	1.2E+00	mg/kg	40SB1A	7/17	0.0058 - 0.0059	1.2E+00	--	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene[8]	8.0E-02	2.2E-01	mg/kg	40SS4	2/17	0.0059 - 0.0059	2.2E-01	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
	120-12-7	Anthracene	1.2E-01	1.2E-01	mg/kg	40SS2	1/17	0.0054 - 0.0054	1.2E-01	--	2.3E+03	N	3.1E+04	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	1.1E-02	3.9E-01	mg/kg	40SS4	11/17	0.0022 - 0.0022	3.9E-01	--	2.2E-01	C	3.9E+00	C	IND	Y	**ARES**
	50-32-8	Benzo(a)pyrene	3.8E-03	3.0E-01	mg/kg	40SS2	12/17	0.0016 - 0.0016	3.0E-01	--	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	205-99-2	Benzo(b)fluoranthene	4.2E-03	5.7E-01	mg/kg	40SS4	15/17	0.0017 - 0.0017	5.7E-01	--	2.2E-01	C	3.9E+00	C	IND	Y	**ARES**
	191-24-2	Benzo(g,h,i)perylene[8]	1.0E-02	1.4E-01	mg/kg	40SS2	6/17	0.0036 - 0.0036	1.4E-01	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	1.0E-02	3.7E-01	mg/kg	40SS2	11/17	0.0014 - 0.0014	3.7E-01	--	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	4.5E-03	6.8E-01	mg/kg	40SB1A	13/17	0.0024 - 0.0024	6.8E-01	--	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	1.9E-02	1.1E-01	mg/kg	40SS5	4/17	0.0042 - 0.0042	1.1E-01	--	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	206-44-0	Fluoranthene	2.0E-02	1.5E+00	mg/kg	40SS2	15/17	0.0021 - 0.0021	1.5E+00	--	3.1E+02	N	4.1E+03	N	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	6.9E-03	2.5E-01	mg/kg	40SS2	10/17	0.0025 - 0.0025	2.5E-01	--	2.2E-01	C	3.9E+00	C	IND	Y	**ARES**
	91-20-3	Naphthalene	2.6E-02	1.1E+00	mg/kg	40SS4	6/17	0.014 - 0.014	1.1E+00	--	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene[8]	1.4E-02	5.5E-01	mg/kg	40SS2	8/17	0.0085 - 0.0085	5.5E-01	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	1.2E-02	8.1E-01	mg/kg	40SS4	15/17	0.0043 - 0.0043	8.1E-01	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
		Dioxin/Furans															
	--	2,3,7,8-TCDD TEQ[9]	4.1E-07	7.1E-06	mg/kg	40SS4	2/2	--	7.1E-06	--	4.3E-06	C	1.9E-05	C	IND	Y	**ARES**
		DRO/GRO															
	--	DRO[10]	2.1E+01	6.8E+01	mg/kg	71SB14A	2/2	1 - 1	6.8E+01	--	--	--	1.0E+02	--	VDEQ	N	BSL

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RDA = Recommended Daily Allowance Based Screening Level
ARAR = Applicable, Relevant, and Appropriate Requirement
VDEQ = Virginia Department of Environmental Quality

TBC = To-Be-Considered
RBC = USEPA Region III Risk-Based Concentration
(RBC) values from the October 11, 2007,
RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
C/N = Carcinogenic/Noncarcinogenic per EPA RBC Table (October 2007)

ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Chlordane RBC value was used
[5] = Endosulfan RBC value was used
[6] = Endrin RBC value was used
[7] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[8] = Pyrene RBC value was used
[9] = See Table 6-3 for 2,3,7,8-TCDD TEQ Calculations
[10] = VDEQ TPH Screening Level used

Table E.1-2.2
SWMU 40 COPC Determination - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Total Soil
Exposure Medium:	Total Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Total Soil		**TAL Metals**															
	7429-90-5	Aluminum	659	47,500	mg/kg	40SB10B	51/51	1.6 - 9.3	47,500	40,041	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.31	6.1	mg/kg	71SB15C	35/47	0.036 - 0.63	6.1	--	3.13	N	40.88	N	IND	Y	**ARES**
	7440-38-2	Arsenic	1.3	74.6	mg/kg	TESTPIT2F	50/51	0.023 - 0.49	74.6	15.8	0.426	C	1.91	C	IND	Y	***ARES/IND***
	7440-39-3	Barium	14.6	250	mg/kg	71SB15C	51/51	0.02 - 0.1	250	209	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.24	3	mg/kg	40SB10B	51/51	0.01 - 0.03	3	1.02	15.64	N	204.4	N	IND	N	BSL
	7440-43-9	Cadmium	0.08	7.6	mg/kg	71SB15B	31/51	0.0073 - 0.07	7.6	0.69	3.91	N	51.1	N	IND	Y	**ARES**
	7440-70-2	Calcium	457	102,000	mg/kg	40SB5C	51/51	1.1 - 10	102,000	--	--	--	1,100,000	--	IND	N	BSL
	7440-47-3	Chromium[1]	4.1	234	mg/kg	40SB8F	51/51	0.07 - 0.57	234	65.3	23.46	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	1.8	24.85	mg/kg	40SB13C DUP AVG	51/51	0.07 - 0.35	24.85	72.3	--	--	--	--	IND	Y	NSV
	7440-50-8	Copper	2.1	52,000	mg/kg	71SB15C	49/50	0.022 - 45	52,000	53.5	312.86	N	1,040	N	RDA	Y	***ARES/IND***
	7439-89-6	Iron	1,440	98,100	mg/kg	40SB4F DUP AVG	51/51	1.4 - 23	98,100	50,962	5,475	N	71,540	N	IND	Y	***ARES/IND***
	7439-92-1	Lead[2]	2.4	1,100	mg/kg	71SB15C	51/51	0.041 - 1.7	1,100	26.8	400	--	750	--	AL	Y	***ARES/IND***
	7439-95-4	Magnesium	120	66,200	mg/kg	40SB5C	51/51	0.67 - 3.4	66,200	--	--	--	156,000	--	RDA	N	BSL
	7439-96-5	Manganese	10.7	952	mg/kg	40SB1B	51/51	0.02 - 0.14	952	2,543	156.4	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury[3]	0.026	11	mg/kg	71SB15B	45/51	0.0048 - 0.12	11	0.13	2.3	N	31.0	N	IND	Y	**ARES**
	7440-02-0	Nickel	3.6	77.7	mg/kg	40SB8F	51/51	0.027 - 0.17	77.7	62.8	156.4	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	89.2	7,810	mg/kg	40SB3C	51/51	4.3 - 20.1	7,810	--	--	--	2,610,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.12	7.45	mg/kg	40SB1F DUP AVG	48/51	0.063 - 0.56	7.45	--	39.11	N	511	N	IND	N	BSL
	7440-22-4	Silver	0.071	2.71	mg/kg	40SB7F DUP AVG	18/51	0.017 - 0.13	2.71	--	39.11	N	511	N	IND	N	BSL
	7440-23-5	Sodium	86.8	4,690	mg/kg	40SB2C	50/51	19 - 50.1	4,690	--	--	--	626,000	--	RDA	N	BSL
	7440-28-0	Thallium	0.26	1.3	mg/kg	71SB14A	7/32	0.0085 - 0.81	1.3	2.11	0.548	N	7.154	N	IND	Y	**ARES**
	7440-62-2	Vanadium	5.4	95.2	mg/kg	40SB12B	51/51	0.024 - 0.12	95.2	108	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	5.5	16,000	mg/kg	71SB15C	51/51	0.11 - 170	16,000	202	2,346	N	30,660	N	IND	Y	**ARES**
		Pesticides/PCBs															
	72-55-9	4,4'-DDE	1.8E-03	1.8E-03	mg/kg	40SB10A	1/24	0.0004 - 0.0004	1.8E-03	--	1.9E+00	C	8.4E+00	C	IND	N	BSL
	50-29-3	4,4'-DDT	7.7E-03	7.7E-03	mg/kg	40SS4	1/24	0.00039 - 0.00039	7.7E-03	--	1.9E+00	C	8.4E+00	C	IND	N	BSL
	309-00-2	Aldrin	2.1E-03	5.1E-03	mg/kg	40SS4	2/24	0.00017 - 0.00017	5.1E-03	--	3.8E-02	C	1.7E-01	C	IND	N	BSL
	319-84-6	alpha-BHC	0.0E+00	1.9E-03	mg/kg	TESTPIT1F2	1/24	0.00026 - 0.00026	1.9E-03	--	1.0E-01	C	4.5E-01	C	IND	N	BSL
	5103-71-9	alpha-Chlordane[4]	4.9E-04	4.4E-03	mg/kg	TESTPIT1F2	4/24	0.00022 - 0.00022	4.4E-03	--	1.8E+00	C	8.2E+00	C	IND	N	BSL
	319-85-7	beta-BHC	1.4E-03	1.2E-02	mg/kg	40SB12A	7/24	0.00028 - 0.00028	1.2E-02	--	3.5E-01	C	1.6E+00	C	IND	N	BSL
	1031-07-8	Endosulfan Sulfate[5]	2.9E-02	6.4E-02	mg/kg	TESTPIT1F	2/24	0.0004 - 0.0004	6.4E-02	--	4.7E+01	N	6.1E+02	N	IND	N	BSL
	72-20-8	Endrin	3.9E-03	3.9E-03	mg/kg	40SS4	1/24	0.00035 - 0.00035	3.9E-03	--	2.3E+00	N	3.1E+01	N	IND	N	BSL
	53494-70-5	Endrin Ketone[6]	2.4E-02	2.4E-02	mg/kg	40SS4	1/24	0.00039 - 0.00039	2.4E-02	--	2.3E+00	N	3.1E+01	N	IND	N	BSL
	58-89-9	gamma-BHC (Lindane)	5.5E-04	1.1E-02	mg/kg	40SS4	2/24	0.00022 - 0.00022	1.1E-02	--	4.9E-01	C	2.2E+00	C	IND	N	BSL
	5103-74-2	gamma-Chlordane[4]	7.6E-03	7.6E-03	mg/kg	40SS4	1/24	0.00035 - 0.00035	7.6E-03	--	1.8E+00	C	8.2E+00	C	IND	N	BSL
	72-43-5	Methoxychlor	4.3E-02	4.3E-02	mg/kg	40SS4	1/24	0.0014 - 0.0014	4.3E-02	--	3.9E+01	N	5.1E+02	N	IND	N	BSL
	12674-11-2	Aroclor 1016[7]	1.3E-01	2.1E-01	mg/kg	40SB5F	3/64	0.0052 - 0.02	2.1E-01	--	5.5E-01	C	7.2E+00	N	IND	N	BSL
	11141-16-5	Aroclor 1232	3.0E-02	3.0E-02	mg/kg	40SB2B	1/64	0.0054 - 0.021	3.0E-02	--	3.2E-01	C	1.4E+00	C	IND	N	BSL
	53469-21-9	Aroclor 1242	1.7E+01	1.7E+01	mg/kg	40SB9F	1/64	0.0043 - 0.03	1.7E+01	--	3.2E-01	C	1.4E+00	C	IND	Y	***ARES/IND***
	12672-29-6	Aroclor 1248	8.2E-02	2.8E-01	mg/kg	71SB15C	4/64	0.0045 - 0.018	2.8E-01	--	3.2E-01	C	1.4E+00	C	IND	N	BSL
	11097-69-1	Aroclor 1254[8]	2.0E-02	5.0E+00	mg/kg	71SB14B	44/64	0.0073 - 0.16	5.0E+00	--	1.6E-01	N	1.4E+00	C	IND	Y	***ARES/IND***
	11096-82-5	Aroclor 1260	1.3E-02	6.6E-01	mg/kg	40SB13B	20/64	0.0054 - 0.021	6.6E-01	--	3.2E-01	C	1.4E+00	C	IND	Y	**ARES**
		TCL VOCs															
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	5.0E-03	1.1E-02	mg/kg	40SB3B	2/45	0.006 - 0.57	1.1E-02	--	2.3E+05	N	3.1E+06	N	IND	N	BSL
	75-34-3	1,1-Dichloroethane	5.0E-03	5.0E-03	mg/kg	TESTPIT2F	1/45	0.0003 - 0.002	5.0E-03	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	7.0E-04	1.6E-01	mg/kg	40SB4F DUP AVG	2/44	0.0004 - 0.002	1.6E-01	--	7.8E+01	N	1.0E+03	N	IND	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	4.0E-04	4.0E-04	mg/kg	40SB12A	1/44	0.0002 - 0.002	4.0E-04	--	2.0E-01	C	3.6E+00	C	IND	N	BSL
	95-50-1	1,2-Dichlorobenzene	4.0E-04	8.0E-04	mg/kg	40SS5	2/44	0.0002 - 0.002	8.0E-04	--	7.0E+02	N	9.2E+03	N	IND	N	BSL
	541-73-1	1,3-Dichlorobenzene	3.0E-04	4.6E-02	mg/kg	40SB4F DUP AVG	3/44	0.0002 - 0.002	4.6E-02	--	2.3E+01	N	3.1E+02	N	IND	N	BSL
	106-46-7	1,4-Dichlorobenzene	3.0E-04	8.9E-01	mg/kg	40SB4F DUP AVG	12/44	0.0002 - 0.002	8.9E-01	--	2.7E+01	C	1.2E+02	C	IND	N	BSL
	78-93-3	2-Butanone	6.0E-03	5.3E-02	mg/kg	40SB1C	17/45	0.001 - 0.003	5.3E-02	--	4.7E+03	N	6.1E+04	N	IND	N	BSL
	591-78-6	2-Hexanone	2.0E-03	2.0E-03	mg/kg	40SB12A	1/45	0.0005 - 0.003	2.0E-03	--	--	--	--	--	--	Y	NSV
	108-10-1	4-Methyl-2-Pentanone	3.0E-03	3.1E-02	mg/kg	40SB10A	20/45	0.0005 - 0.004	3.1E-02	--	--	--	--	--	--	Y	NSV
	67-64-1	Acetone	8.0E-03	4.6E-01	mg/kg	40SS3	43/45	0.0009 - 0.004	4.6E-01	--	7.0E+03	N	9.2E+04	N	IND	N	BSL
	71-43-2	Benzene	8.0E-04	5.4E-01	mg/kg	40SB4F DUP AVG	17/45	0.0004 - 0.002	5.4E-01	--	1.2E+01	C	5.2E+01	C	IND	N	BSL
	74-83-9	Bromomethane	2.0E-03	6.0E-03	mg/kg	40SB12C	5/45	0.0009 - 0.002	6.0E-03	--	1.1E+01	N	1.4E+02	N	IND	N	BSL
	75-15-0	Carbon Disulfide	6.0E-04	1.9E-01	mg/kg	40SB4F DUP AVG	28/45	0.0005 - 0.002	1.9E-01	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	108-90-7	Chlorobenzene	4.0E-04	1.1E+01	mg/kg	40SB4F DUP AVG	7/45	0.0002 - 0.002	1.1E+01	--	1.6E+02	N	2.0E+03	N	IND	N	BSL
	74-87-3	Chloromethane	1.0E-03	3.0E-03	mg/kg	40SS5	3/45	0.0009 - 0.002	3.0E-03	--	--	--	--	--	--	Y	NSV
	156-59-2	cis-1,2-Dichloroethene	1.0E-03	1.0E-03	mg/kg	40SB11B	2/45	0.0003 - 0.002	1.0E-03	--	7.8E+01	N	1.0E+03	N	--	N	BSL
	110-82-7	Cyclohexane	1.2E-03	1.5E-01	mg/kg	40SB4F DUP AVG	4/45	0.0004 - 0.002	1.5E-01	--	--	--	--	--	--	Y	NSV
	75-71-8	Dichlorodifluoromethane	1.0E-03	3.0E-03	mg/kg	40SS5	6/45	0.0004 - 0.002	3.0E-03	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	100-41-4	Ethylbenzene	7.0E-04	9.2E-01	mg/kg	40SB4F DUP AVG	28/45	0.0004 - 0.002	9.2E-01	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	98-82-8	Isopropylbenzene	9.0E-04	1.6E-01	mg/kg	40SB4F DUP AVG	8/45	0.006 - 0.57	1.6E-01	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	79-20-9	Methyl Acetate	3.0E-03	9.6E-01	mg/kg	40SB4F DUP AVG	17/45	0.0005 - 0.002	9.6E-01	--	7.8E+03	N	1.0E+05	N	IND	N	BSL
	1634-04-4	Methyl Tert-Butyl Ethe	2.0E-03	2.0E-03	mg/kg	40SB10A	1/45	0.006 - 0.57	2.0E-03	--	1.6E+02	C	7.2E+02	C	IND	N	BSL

Table E.1-2.2
SWMU 40 COPC Determination - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Total Soil
Exposure Medium:	Total Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
	108-87-2	Methylcyclohexane	5.8E-04	4.1E-01	mg/kg	40SB4F DUP AVG	10/45	0.0004 - 0.002	4.1E-01	--	--	--	--	--	--	Y	NSV
	75-09-2	Methylene Chloride	6.8E-04	1.7E-01	mg/kg	40SB4F DUP AVG	34/45	0.0005 - 0.003	1.7E-01	--	8.5E+01	C	3.8E+02	C	IND	N	BSL
	100-42-5	Styrene	4.5E-04	4.0E-03	mg/kg	40SB3B	11/45	0.0002 - 0.002	4.0E-03	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	127-18-4	Tetrachloroethene	1.0E-03	1.0E-03	mg/kg	40SB12A	1/45	0.0003 - 0.002	1.0E-03	--	1.2E+00	C	5.3E+00	C	IND	N	BSL
	108-88-3	Toluene	8.0E-04	4.6E-01	mg/kg	40SB4F DUP AVG	45/45	0.0004 - 0.002	4.6E-01	--	6.3E+02	N	8.2E+03	N	IND	N	BSL
	79-01-6	Trichloroethene	6.0E-04	2.2E-02	mg/kg	40SS2	40/45	0.0004 - 0.002	2.2E-02	--	1.6E+00	C	7.2E+00	C	IND	N	BSL
	75-69-4	Trichlorofluoromethane	2.1E-03	6.0E-03	mg/kg	40SB3B	2/45	0.0005 - 0.002	6.0E-03	--	2.3E+03	N	3.1E+04	N	IND	N	BSL
	75-01-4	Vinyl Chloride	2.0E-03	2.0E-03	mg/kg	40SB11F	1/45	0.0004 - 0.002	2.0E-03	--	9.0E-02	C	4.0E+00	C	IND	N	BSL
	1330-20-7	Xylenes (Total)	1.0E-03	2.0E+00	mg/kg	40SB4F DUP AVG	44/45	0.001 - 0.003	2.0E+00	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
		TCL SVOCs															
	92-52-4	1,1'-Biphenyl	2.7E-02	8.3E-02	mg/kg	40SB4F DUP AVG	6/45	0.022 - 0.022	8.3E-02	--	3.9E+02	N	5.1E+03	N	IND	N	BSL
	91-57-6	2-Methylnaphthalene	4.5E-02	6.0E-01	mg/kg	40SB4F DUP AVG	11/45	0.024 - 0.024	6.0E-01	--	3.1E+01	N	4.1E+02	N	IND	N	BSL
	59-50-7	4-Chloro-3-Methylphenol[9]	8.2E-02	1.3E-01	mg/kg	40SB9F	2/45	0.029 - 0.029	1.3E-01	--	3.9E+04	N	5.1E+05	N	IND	N	BSL
	106-44-5	4-Methylphenol	6.1E-02	5.7E-01	mg/kg	40SB9F	5/45	0.048 - 0.048	5.7E-01	--	3.9E+01	N	5.1E+02	N	IND	N	BSL
	98-86-2	Acetophenone	3.6E-02	3.6E-02	mg/kg	40SB7F DUP AVG	1/45	0.023 - 0.023	3.6E-02	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	100-52-7	Benzaldehyde	6.6E-02	1.2E-01	mg/kg	TESTPIT1F	3/45	0.039 - 0.039	1.2E-01	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	3.8E-02	3.9E+00	mg/kg	40SB4F DUP AVG	34/45	0.032 - 0.032	3.9E+00	--	4.6E+01	C	2.0E+02	C	IND	N	BSL
	85-68-7	Butylbenzylphthalate	3.7E-01	5.9E+00	mg/kg	40SB5F	3/45	0.023 - 0.6	5.9E+00	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	105-60-2	Caprolactam	8.0E-01	8.0E-01	mg/kg	40SS2	1/45	0.062 - 0.062	8.0E-01	--	3.9E+03	N	5.1E+04	N	IND	N	BSL
	86-74-8	Carbazole	4.7E-02	2.0E-01	mg/kg	40SS4	2/45	0.029 - 0.029	2.0E-01	--	3.2E+01	C	1.4E+02	C	IND	N	BSL
	84-74-2	Di-n-butylphthalate	3.2E-02	5.4E-01	mg/kg	40SB4F DUP AVG	13/45	0.027 - 0.6	5.4E-01	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	117-84-0	Di-n-octylphthalate	2.6E-02	1.1E+00	mg/kg	40SB4F DUP AVG	10/45	0.021 - 0.6	1.1E+00	--	--	--	--	--	--	Y	NSV
	132-64-9	Dibenzofuran	4.4E-02	5.6E-02	mg/kg	40SS5	3/45	0.024 - 0.024	5.6E-02	--	7.8E+00	--	1.0E+02	--	IND	N	BSL
	84-66-2	Diethylphthalate	7.2E-02	1.8E-01	mg/kg	40SB5F	6/45	0.025 - 0.6	1.8E-01	--	6.3E+03	N	8.2E+04	N	IND	N	BSL
	131-11-3	Dimethylphthalate	9.5E-02	9.5E-02	mg/kg	TESTPIT1F	1/45	0.023 - 0.6	9.5E-02	--	--	--	--	--	--	Y	NSV
	86-30-6	n-Nitrosodiphenylamine	4.4E-02	3.5E+00	mg/kg	TESTPIT2F	10/45	0.019 - 1.1	3.5E+00	--	1.3E+02	C	5.8E+02	C	IND	N	BSL
	108-95-2	Phenol	2.1E-01	2.1E-01	mg/kg	40SB4F DUP AVG	1/45	0.034 - 0.034	2.1E-01	--	2.3E+03	N	3.1E+04	N	IND	N	BSL
		TCL PAHs															
	83-32-9	Acenaphthene	1.7E-02	6.5E+00	mg/kg	40SB9F	17/45	0.0058 - 0.0059	6.5E+00	--	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene[10]	7.4E-02	4.1E+00	mg/kg	TESTPIT1F	9/45	0.0059 - 0.0059	4.1E+00	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
	120-12-7	Anthracene	0.0E+00	1.2E-01	mg/kg	40SS2	2/45	0.0054 - 0.0054	1.2E-01	--	2.3E+03	N	3.1E+04	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	1.1E-02	2.3E+00	mg/kg	40SB1F DUP AVG	18/45	0.0022 - 0.0022	2.3E+00	--	2.2E-01	C	3.9E+00	C	IND	Y	**ARES**
	50-32-8	Benzo(a)pyrene	3.8E-03	4.5E-01	mg/kg	40SB4F DUP AVG	19/45	0.0016 - 0.0016	4.5E-01	--	2.2E-02	C	3.9E-01	C	IND	Y	***ARES/IND***
	205-99-2	Benzo(b)fluoranthene	4.2E-03	5.7E-01	mg/kg	40SS4	27/45	0.0017 - 0.0017	5.7E-01	--	2.2E-01	C	3.9E+00	C	IND	Y	**ARES**
	191-24-2	Benzo(g,h,i)perylene[10]	1.0E-02	1.4E-01	mg/kg	40SS2	8/45	0.0036 - 0.0036	1.4E-01	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	1.0E-02	5.2E-01	mg/kg	40SB4F DUP AVG	17/45	0.0014 - 0.0014	5.2E-01	--	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	4.5E-03	3.4E+00	mg/kg	40SB1F DUP AVG	29/45	0.0024 - 0.0024	3.4E+00	--	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	1.9E-02	1.1E-01	mg/kg	40SS5	5/45	0.0042 - 0.0042	1.1E-01	--	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	206-44-0	Fluoranthene	7.6E-03	1.6E+00	mg/kg	TESTPIT2F	31/45	0.0021 - 0.0021	1.6E+00	--	3.1E+02	N	4.1E+03	N	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	6.9E-03	4.0E-01	mg/kg	40SB13C DUP AVG	13/45	0.0025 - 0.0025	4.0E-01	--	2.2E-01	C	3.9E+00	C	IND	Y	**ARES**
	91-20-3	Naphthalene	2.6E-02	3.1E+00	mg/kg	40SB7F DUP AVG	9/45	0.014 - 0.014	3.1E+00	--	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene[10]	1.4E-02	5.5E-01	mg/kg	40SS2	13/45	0.0085 - 0.0085	5.5E-01	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	1.2E-02	9.4E-01	mg/kg	40SB5F	34/45	0.0043 - 0.0043	9.4E-01	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
		Dioxin/Furans															
	--	2,3,7,8-TCDD TEQ[11]	4.1E-07	9.7E-06	mg/kg	TESTPIT2F	3/3	--	9.7E-06	--	4.3E-06	C	1.9E-05	C	IND	Y	**ARES**
		Explosives/Nitroglycerin															
	55-63-0	Nitroglycerin	130	130	mg/kg	TESTPIT1F	1/45	1 - 1	130	--	1	N	10	N	IND	Y	***ARES/IND***
		DRO/GRO															
	--	DRO	21	850	mg/kg	71SB15C	6/6	1 - 12	850	--	--	--	100	--	--	Y	**ASL**
	--	GRO	8	13	mg/kg	71SB14C	3/6	0.93 - 1.2	13	--	--	--	100	--	--	N	BSL
	--	DRO+GRO[12]	21	859.7	mg/kg	71SB15C	6/6	--	859.7	--	--	--	100	--	VDEQ	Y	**ASL**

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RDA = Recommended Daily Allowance Based Screening Level
ARAR = Applicable, Relevant, and Appropriate Requirement
TBC = To-Be-Considered

[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Chlordane RBC value was used
[5] = Endosulfan RBC value was used
[6] = Endrin RBC value was used
[7] = Noncarcinogenic Industrial RBC value for Aroclor 1016 was used for screening
[8] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[9] = 3-Methylphenol RBC value was used
[10] = Pyrene RBC value was used
[11] = See Table 6-3 for 2,3,7,8-TCDD TEQ Calculations
[12] = VDEQ TPH Screening Level used

RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
C/N = Carcinogenic/Noncarcinogenic per EPA RBC Table (October 2007)

ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
ASL = Above Screening Level
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

Table E.1-2.3
Non-detected Chemical MDL Screening for SWMU 40 - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
Gasoline Range Organics								
GRO	--	mg/kg	3	6	0.93	1	--	--
TAL Metals								
Antimony	7440-36-0	mg/kg	12	47	0.17	1	3.13	N
Arsenic	7440-38-2	mg/kg	1	51	0.27	0	0.426	N
Cadmium	7440-43-9	mg/kg	20	51	0.03	1	3.91	N
Copper	7440-50-8	mg/kg	1	50	0.16	0	312.86	N
Mercury[1]	7439-97-6	mg/kg	6	51	0.019	0	2.35	N
Selenium	7782-49-2	mg/kg	3	51	0.36	0	39.11	N
Silver	7440-22-4	mg/kg	33	51	0.08	0	39.11	N
Sodium	7440-23-5	mg/kg	1	51	38.3	38	--	NS
Thallium	7440-28-0	mg/kg	25	32	0.26	1	0.548	**Y**
Pesticides/PCBs								
4,4'-DDD	72-54-8	ug/kg	24	24	0.32	85	2.7E+03	N
4,4'-DDE	72-55-9	ug/kg	23	24	0.4	44	1.9E+03	N
4,4'-DDT	50-29-3	ug/kg	23	24	0.39	130	1.9E+03	N
Aldrin	309-00-2	ug/kg	22	24	0.17	21	3.8E+01	N
alpha-BHC	319-84-6	ug/kg	23	24	0.26	21	1.0E+02	N
alpha-Chlordane[2]	5103-71-9	ug/kg	20	24	0.22	44	1.8E+03	N
beta-BHC	319-85-7	ug/kg	17	24	0.28	44	3.5E+02	N
delta-BHC[3]	319-86-8	ug/kg	24	24	0.15	21	1.0E+02	N
Dieldrin	60-57-1	ug/kg	24	24	0.43	44	4.0E+01	**Y**
Endosulfan I	959-98-8	ug/kg	24	24	0.43	44	4.7E+04	N
Endosulfan II	33213-65-9	ug/kg	24	24	0.58	85	4.7E+04	N
Endosulfan Sulfate[4]	1031-07-8	ug/kg	22	24	0.4	4	4.7E+04	N
Endrin	72-20-8	ug/kg	23	24	0.35	85	2.3E+03	N
Endrin Aldehyde[5]	7421-93-4	ug/kg	24	24	0.35	85	2.3E+03	N
Endrin Ketone[5]	53494-70-5	ug/kg	23	24	0.39	210	2.3E+03	N
gamma-BHC (Lindane)	58-89-9	ug/kg	22	24	0.22	21	4.9E+02	N
gamma-Chlordane[2]	5103-74-2	ug/kg	23	24	0.35	21	1.8E+03	N
Heptachlor	76-44-8	ug/kg	24	24	0.34	21	1.4E+02	N
Heptachlor Epoxide	1024-57-3	ug/kg	24	24	0.26	21	7.0E+01	N
Methoxychlor	72-43-5	ug/kg	23	24	1.4	210	3.9E+04	N
Toxaphene	8001-35-2	ug/kg	24	24	18	2,100	5.8E+02	**Y**
Aroclor 1016	12674-11-2	ug/kg	61	64	5.2	1,700	5.5E+02	**Y**
Aroclor 1221	11104-28-2	ug/kg	64	64	14	2,200	3.2E+02	**Y**
Aroclor 1232	11141-16-5	ug/kg	63	64	5.4	1,700	3.2E+02	**Y**
Aroclor 1242	53469-21-9	ug/kg	63	64	7.6	1,200	3.2E+02	**Y**
Aroclor 1248	12672-29-6	ug/kg	60	64	4.5	1,200	3.2E+02	**Y**
Aroclor 1254[6]	11097-69-1	ug/kg	20	64	8.5	9	1.6E+02	N
Aroclor 1260	11096-82-5	ug/kg	44	64	5.4	1,700	3.2E+02	**Y**
TCL VOCs								
1,1,1-Trichloroethane	71-55-6	ug/kg	45	45	0.5	2	1.6E+07	N
1,1,2,2-Tetrachloroethane	79-34-5	ug/kg	45	45	0.2	2	3.2E+03	N
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/kg	43	45	6	17	2.3E+08	N
1,1,2-Trichloroethane	79-00-5	ug/kg	45	45	0.1	2	1.1E+04	N
1,1-Dichloroethane	75-34-3	ug/kg	44	45	0.3	2	1.6E+06	N
1,1-Dichloroethene	75-35-4	ug/kg	45	45	0.6	2	3.9E+05	N
1,2,4-Trichlorobenzene	120-82-1	ug/kg	42	44	0.4	2	7.8E+04	N
1,2-Dibromo-3-chloropropane	96-12-8	ug/kg	43	44	0.2	2	2.0E+02	N
1,2-Dibromoethane	106-93-4	ug/kg	45	45	0.2	2	3.2E+02	N
1,2-Dichlorobenzene	95-50-1	ug/kg	42	44	0.2	2	7.0E+05	N
1,2-Dichloroethane	107-06-2	ug/kg	45	45	0.3	2	7.0E+03	N
1,2-Dichloropropane	78-87-5	ug/kg	45	45	0.2	2	9.4E+03	N
1,3-Dichlorobenzene	541-73-1	ug/kg	41	44	0.2	2	2.3E+04	N
1,4-Dichlorobenzene	106-46-7	ug/kg	32	44	0.2	2	2.7E+04	N
2-Butanone	78-93-3	ug/kg	28	45	1	3	4.7E+06	N
2-Hexanone	591-78-6	ug/kg	44	45	0.5	3	--	NS
4-Methyl-2-Pentanone	108-10-1	ug/kg	25	45	0.5	4	--	NS
Acetone	67-64-1	ug/kg	2	45	1	4	7.0E+06	N
Benzene	71-43-2	ug/kg	28	45	0.4	2	1.2E+04	N
Bromodichloromethane	75-27-4	ug/kg	45	45	0.2	2	1.0E+04	N
Bromoform	75-25-2	ug/kg	45	45	0.2	2	8.1E+04	N
Bromomethane	74-83-9	ug/kg	40	45	0.9	2	1.1E+04	N
Carbon Disulfide	75-15-0	ug/kg	17	45	0.5	2	7.8E+05	N
Carbon Tetrachloride	56-23-5	ug/kg	45	45	0.5	2	4.9E+03	N
Chlorobenzene	108-90-7	ug/kg	38	45	0.2	2	1.6E+05	N

Table E.1-2.3
Non-detected Chemical MDL Screening for SWMU 40 - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
Chloroethane	75-00-3	ug/kg	45	45	0.4	2	2.2E+05	N
Chloroform	67-66-3	ug/kg	45	45	0.4	2	7.8E+04	N
Chloromethane	74-87-3	ug/kg	42	45	0.9	2	--	NS
cis-1,2-Dichloroethene	156-59-2	ug/kg	43	45	0.3	2	7.8E+04	N
cis-1,3-Dichloropropene	10061-01-5	ug/kg	45	45	0.3	2	6.4E+03	N
Cyclohexane	110-82-7	ug/kg	41	45	0.4	2	--	NS
Dibromochloromethane	124-48-1	ug/kg	45	45	0.2	2	7.6E+03	N
Dichlorodifluoromethane	75-71-8	ug/kg	39	45	0.4	2	1.6E+06	N
Ethylbenzene	100-41-4	ug/kg	17	45	0.4	2	7.8E+05	N
Isopropylbenzene	98-82-8	ug/kg	37	45	6	17	7.8E+05	N
Methyl Acetate	79-20-9	ug/kg	28	45	0.5	1	7.8E+06	N
Methyl tert-butyl Ether	1634-04-4	ug/kg	44	45	6	570	1.6E+05	N
Methylcyclohexane	108-87-2	ug/kg	35	45	0.4	2	--	NS
Methylene Chloride	75-09-2	ug/kg	11	45	0.5	1	8.5E+04	N
Styrene	100-42-5	ug/kg	34	45	0.2	1	1.6E+06	N
Tetrachloroethene	127-18-4	ug/kg	44	45	0.3	2	1.2E+03	N
trans-1,2-Dichloroethene	156-60-5	ug/kg	45	45	0.4	2	1.6E+05	N
trans-1,3-Dichloropropene	10061-02-6	ug/kg	45	45	0.2	2	6.4E+03	N
Trichloroethene	79-01-6	ug/kg	5	45	0.5	1	1.6E+03	N
Trichlorofluoromethane	75-69-4	ug/kg	43	45	0.5	1	2.3E+06	N
Vinyl Chloride	75-01-4	ug/kg	44	45	0.4	2	9.0E+01	N
Xylenes (Total)	1330-20-7	ug/kg	1	45	1	1	1.6E+06	N
TCL SVOCs								
1,1'-Biphenyl	92-52-4	ug/kg	39	45	22	22	3.9E+05	N
2,2'-oxybis(1-chloropropane)	108-60-1	ug/kg	45	45	30	30	9.1E+03	N
2,4,5-Trichlorophenol	95-95-4	ug/kg	45	45	49	49	7.8E+05	N
2,4,6-Trichlorophenol [7]	88-06-2	ug/kg	45	45	50	50	7.8E+03	N
2,4-Dichlorophenol	120-83-2	ug/kg	45	45	22	22	2.3E+04	N
2,4-Dimethylphenol	105-67-9	ug/kg	45	45	30	30	1.6E+05	N
2,4-Dinitrophenol	51-28-5	ug/kg	45	45	170	2,400	1.6E+04	N
2,4-Dinitrotoluene	121-14-2	ug/kg	42	45	20	20	1.6E+04	N
2,6-Dinitrotoluene	606-20-2	ug/kg	44	45	21	21	7.8E+03	N
2-Chloronaphthalene	91-58-7	ug/kg	45	45	22	22	6.3E+05	N
2-Chlorophenol	95-57-8	ug/kg	45	45	18	18	3.9E+04	N
2-Methylnaphthalene	91-57-6	ug/kg	34	45	24	24	3.1E+04	N
2-Methylphenol	95-48-7	ug/kg	45	45	27	27	3.9E+05	N
2-Nitroaniline	88-74-4	ug/kg	45	45	29	29	--	NS
2-Nitrophenol	88-75-5	ug/kg	45	45	26	26	--	NS
3,3'-Dichlorobenzidine	91-94-1	ug/kg	45	45	29	29	1.4E+03	N
3-Nitroaniline	99-09-2	ug/kg	45	45	34	34	--	NS
4,6-Dinitro-2-Methylphenol	534-52-1	ug/kg	45	45	35	35	--	NS
4-Bromophenyl-Phenylether	101-55-3	ug/kg	45	45	390	600	--	NS
4-Chloro-3-Methylphenol	59-50-7	ug/kg	43	45	29	470	--	NS
4-Chloroaniline	106-47-8	ug/kg	45	45	16	16	3.1E+04	N
4-Chlorophenyl-Phenylether	7005-72-3	ug/kg	45	45	390	600	--	NS
4-Methylphenol	106-44-5	ug/kg	40	45	48	48	3.9E+04	N
4-Nitroaniline	100-01-6	ug/kg	45	45	39	39	--	NS
4-Nitrophenol	100-02-7	ug/kg	45	45	75	75	--	NS
Acenaphthene	83-32-9	ug/kg	44	45	31	31	4.7E+05	N
Acenaphthylene [7]	208-96-8	ug/kg	43	45	17	17	2.3E+05	N
Acetophenone	98-86-2	ug/kg	44	45	23	23	7.8E+05	N
Anthracene	120-12-7	ug/kg	41	45	25	25	2.3E+06	N
Atrazine	1912-24-9	ug/kg	45	45	16	16	2.9E+03	N
Benzaldehyde	100-52-7	ug/kg	42	45	39	39	7.8E+05	N
Benzo(a)anthracene	56-55-3	ug/kg	37	45	29	29	2.2E+02	N
Benzo(a)pyrene	50-32-8	ug/kg	38	45	23	23	2.2E+01	**Y**
Benzo(b)fluoranthene	205-99-2	ug/kg	38	45	36	36	2.2E+02	N
Benzo(g,h,i)perylene [7]	191-24-2	ug/kg	37	45	3.6	23	2.3E+05	N
Benzo(k)fluoranthene	207-08-9	ug/kg	38	45	29	29	2.2E+03	N
bis(2-Chloroethoxy)methane	111-91-1	ug/kg	45	45	21	21	--	NS
bis(2-Chloroethyl)ether	111-44-4	ug/kg	45	45	18	18	5.8E+02	N
bis(2-ethylhexyl)phthalate	117-81-7	ug/kg	11	45	32	32	4.6E+04	N
Butylbenzylphthalate	85-68-7	ug/kg	42	45	62	600	1.6E+06	N
Caprolactam	105-60-2	ug/kg	44	45	62	62	3.9E+06	N
Carbazole	86-74-8	ug/kg	43	45	29	29	3.2E+04	N
Chrysene	218-01-9	ug/kg	33	45	28	28	2.2E+04	N
Di-n-butylphthalate	84-74-2	ug/kg	32	45	27	570	7.8E+05	N
Di-n-octylphthalate	117-84-0	ug/kg	35	45	21	940	--	NS

Table E.1-2.3
Non-detected Chemical MDL Screening for SWMU 40 - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
Dibenz(a,h)anthracene	53-70-3	ug/kg	42	45	21	21	2.2E+01	N
Dibenzofuran	132-64-9	ug/kg	42	45	24	24	7.8E+03	N
Diethylphthalate	84-66-2	ug/kg	39	45	25	600	6.3E+06	N
Dimethylphthalate	131-11-3	ug/kg	44	45	23	600	--	NS
Fluoranthene	206-44-0	ug/kg	28	45	18	18	3.1E+05	N
Fluorene	86-73-7	ug/kg	41	45	18	18	3.1E+05	N
Hexachlorobenzene	118-74-1	ug/kg	45	45	22	22	4.0E+02	N
Hexachlorobutadiene [8]	87-68-3	ug/kg	45	45	24	24	7.8E+03	N
Hexachlorocyclopentadiene	77-47-4	ug/kg	45	45	67	67	4.7E+04	N
Hexachloroethane [10]	67-72-1	ug/kg	45	45	17	17	7.8E+03	N
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	38	45	20	20	2.2E+02	N
Isophorone	78-59-1	ug/kg	45	45	28	28	6.7E+05	N
n-Nitrosodi-n-Propylamine	621-64-7	ug/kg	45	45	21	21	9.1E+01	N
n-Nitrosodiphenylamine	86-30-6	ug/kg	35	45	19	1,100	1.3E+05	N
Naphthalene	91-20-3	ug/kg	36	45	21	21	1.6E+05	N
Nitrobenzene	98-95-3	ug/kg	45	45	28	28	3.9E+03	N
Pentachlorophenol	87-86-5	ug/kg	45	45	46	46	5.3E+03	N
Phenanthrene[7]	85-01-8	ug/kg	28	45	24	24	2.3E+05	N
Phenol	108-95-2	ug/kg	44	45	34	34	2.3E+06	N
Pyrene	129-00-0	ug/kg	30	45	24	24	2.3E+05	N
Dioxin/Furans								
1,2,3,4,7,8,9-HpCDF	55673-89-7	pg/g	1	3	0.6	1	--	NS
1,2,3,4,7,8-HxCDD	39227-28-6	pg/g	1	3	0.5	1	--	NS
1,2,3,4,7,8-HxCDF	70648-26-9	pg/g	1	3	0.3	0	--	NS
1,2,3,6,7,8-HxCDD	57653-85-7	pg/g	1	3	0.6	1	--	NS
1,2,3,6,7,8-HxCDF	57117-44-9	pg/g	1	3	0.3	0	--	NS
1,2,3,7,8,9-HxCDD	19408-74-3	pg/g	1	3	0.5	1	1.0E+02	N
1,2,3,7,8,9-HxCDF	72918-21-9	pg/g	3	3	0.4	1	--	NS
1,2,3,7,8-PeCDD	40321-76-4	pg/g	2	3	0.4	1	--	NS
1,2,3,7,8-PeCDF	57117-41-6	pg/g	1	3	0.3	0	--	NS
2,3,4,6,7,8-HxCDF	60851-34-5	pg/g	1	3	0.4	0	--	NS
2,3,4,7,8-PeCDF	57117-31-4	pg/g	1	3	0.3	0	--	NS
2,3,7,8-TCDD	1746-01-6	pg/g	3	3	0.3	0	4.3E+00	N
2,3,7,8-TCDF	51207-31-9	pg/g	2	3	0.3	0	--	NS
Total PeCDD	36088-22-9	pg/g	1	3	0.4	0	--	NS
Total TCDD	41903-57-5	pg/g	3	3	0.3	0	--	NS
Total TCDF	55722-27-5	pg/g	1	3	0.3	0	--	NS
PAHs								
Acenaphthene	83-32-9	ug/kg	28	45	5.8	6	4.7E+05	N
Acenaphthylene[7]	208-96-8	ug/kg	36	45	5.9	6	2.3E+05	N
Anthracene	120-12-7	ug/kg	43	45	5.4	5	2.3E+06	N
Benzo(a)pyrene	50-32-8	ug/kg	26	45	1.6	2	2.2E+01	N
Benzo(a)anthracene	56-55-3	ug/kg	27	45	2.2	2	2.2E+02	N
Benzo(b)fluoranthene	205-99-2	ug/kg	18	45	1.7	2	2.2E+02	N
Benzo(k)fluoranthene	207-08-9	ug/kg	28	45	1.4	1	2.2E+03	N
Benzo(g,h,i)perylene[7]	191-24-2	ug/kg	37	45	3.6	4	2.3E+05	N
Chrysene	218-01-9	ug/kg	16	45	2.4	2	2.2E+04	N
Dibenz(a,h)anthracene	53-70-3	ug/kg	40	45	4.2	4	2.2E+01	N
Fluoranthene	206-44-0	ug/kg	14	45	2.1	2	3.1E+05	N
Fluorene	86-73-7	ug/kg	45	45	14	14	3.1E+05	N
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	32	45	2.5	3	2.2E+02	N
Naphthalene	91-20-3	ug/kg	36	45	14	14	1.6E+05	N
Phenanthrene[7]	85-01-8	ug/kg	32	45	8.5	9	2.3E+05	N
Pyrene	129-00-0	ug/kg	11	45	4.3	4	2.3E+05	N
Explosives								
1,3,5-Trinitrobenzene	99-35-4	mg/kg	45	45	0.079	0	2.3E+02	N
1,3-Dinitrobenzene	99-65-0	mg/kg	45	45	0.097	0	7.8E-01	N
2,4,6-Trinitrotoluene[11]	118-96-7	mg/kg	45	45	0.16	0	3.9E+00	N
2,4-Dinitrotoluene	121-14-2	mg/kg	45	45	0.12	0	1.6E+01	N
2,6-Dinitrotoluene	606-20-2	mg/kg	45	45	0.19	0	7.8E+00	N
2-Amino-4,6-Dinitrotoluene	35572-78-2	mg/kg	45	45	0.1	1	1.6E+01	N
2-Nitrotoluene	88-72-2	mg/kg	45	45	0.16	0	7.8E+01	N
3-Nitrotoluene	99-08-1	mg/kg	45	45	0.11	0	--	NS
4-Amino-2,6-Dinitrotoluene	1946-51-0	mg/kg	45	45	0.095	0	1.6E+01	N
4-Nitrotoluene [12]	99-99-0	mg/kg	45	45	0.27	0	3.1E+01	N
HMX	2691-41-0	mg/kg	45	45	0.1	0	3.9E+02	N

Table E.1-2.3
Non-detected Chemical MDL Screening for SWMU 40 - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
Nitrobenzene	98-95-3	mg/kg	45	45	0.17	0	3.9E+00	N
RDX	121-82-4	mg/kg	45	45	0.28	0	5.8E+00	N
Tetryl	479-45-8	mg/kg	45	45	0.4	0	3.1E+01	N
Nitroglycerin								
Nitroglycerin	55-63-0	mg/kg	44	45	1	1	7.8E-01	**Y**

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
R-RBC = Residential RBC
SL = Screening Level

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available

[1] = Mercuric chloride soil RBC value used
[2] = Chlordane RBC value was used
[3] = Alpha-BHC RBC value was used
[4] = Endosulfan RBC value was used
[5] = Endrin RBC value was used
[6] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[7] = Noncarcinogenic RBC value for 2,4,6-Trichlorophenol was used
[8] = Noncarcinogenic RBC value for Hexachlorobutadiene was used
[9] = Noncarcinogenic RBC value for Hexachloroethane was used
[10] = Pyrene RBC value was used
[11] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening
[12] = Noncarcinogenic RBC value for 4-Nitrotoluene was used

Table E.1-2.4
SWMU 40 Groundwater COPC Selection
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter	CAS #	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	C/N	Adjusted Tap Water RBC	Potential ARAR/TBC	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Perchlorate (ug/L)														
Perchlorate	14797-73-0	0.52	0.655	µg/L	40MW5 DUP AVG	3/3	0.08 - 0.08	0.655	N	2.56	--	--	N	BSL
TAL Metals (ug/L)														
Antimony, Total	7440-36-0	0.43	0.43	µg/L	40MW5 DUP AVG	1/3	0.44 - 0.44	0.43	N	1.46	--	--	N	BSL
Barium, Dissolved	7440-39-3	29	46	µg/L	40MW5 DUP AVG	3/3	0.52 - 0.52	46	N	730	2,000	MCL	N	BSL
Barium, Total	7440-39-3	29	43.5	µg/L	40MW5 DUP AVG	3/3	0.52 - 0.52	43.5	N	730	2,000	MCL	N	BSL
Calcium, Dissolved	7440-70-2	53,000	70,000	µg/L	40MW5 DUP AVG	3/3	40 - 200	70,000	--	--	220,000	RDA	N	BSL
Calcium, Total	7440-70-2	52,000	71,000	µg/L	40MW6	3/3	40 - 40	71,000	--	--	220,000	RDA	N	BSL
Chromium, Dissolved [1]	7440-47-3	1.2	1.6	µg/L	40MW5 DUP AVG	3/3	0.31 - 0.31	1.6	N	10.95	100	MCL	N	BSL
Chromium, Total [1]	7440-47-3	1.365	5	µg/L	40MW6	3/3	0.31 - 0.31	5	N	10.95	100	MCL	N	BSL
Cobalt, Dissolved	7440-48-4	0.3	0.45	µg/L	40MW5 DUP AVG	3/3	0.096 - 0.096	0.45	--	--	--	--	Y	NSV
Cobalt, Total	7440-48-4	0.125	0.3	µg/L	40MW6	3/3	0.096 - 0.096	0.3	--	--	--	--	Y	NSV
Copper, Dissolved	7440-50-8	0.86	0.91	µg/L	40MW6	3/3	0.33 - 0.33	0.91	N	146	1,300	MCL	N	BSL
Copper, Total	7440-50-8	0.79	1.3	µg/L	40MW3	3/3	0.33 - 0.33	1.3	N	146	1,300	MCL	N	BSL
Iron, Dissolved	7439-89-6	9.85	17	µg/L	40MW3	3/3	5.7 - 5.7	17	N	2,555	--	--	N	BSL
Iron, Total	7439-89-6	12.5	28	µg/L	40MW6	3/3	5.7 - 5.7	28	N	2,555	--	--	N	BSL
Lead, Total[2]	7439-92-1	0.51	0.51	µg/L	40MW3	1/3	0.33 - 0.33	0.51	--	15	--	--	N	BSL
Manganese, Dissolved	7439-96-5	0.4825	0.4825	µg/L	40MW5 DUP AVG	1/3	0.43 - 0.43	0.4825	N	73	--	--	N	BSL
Manganese, Total	7439-96-5	0.48	0.48	µg/L	40MW3	1/3	0.43 - 0.43	0.48	N	73	--	--	N	BSL
Magnesium, Dissolved	7439-95-4	18,000	22,000	µg/L	40MW5 DUP AVG	3/3	38 - 38	22,000	--	--	31,000	RDA	N	BSL
Magnesium, Total	7439-95-4	18,000	22,000	µg/L	40MW6	3/3	38 - 38	22,000	--	--	31,000	RDA	N	BSL
Mercury, Total[3]	7439-97-6	0.04	0.04	µg/L	40MW3	1/3	0.039 - 0.039	0.04	N	0.37	2	MCL	N	BSL
Nickel, Dissolved	7440-02-0	1.145	1.8	µg/L	40MW6	3/3	0.28 - 0.28	1.8	N	73	--	--	N	BSL
Nickel, Total	7440-02-0	0.935	2.1	µg/L	40MW6	3/3	0.28 - 0.28	2.1	N	73	--	--	N	BSL
Potassium, Dissolved	7440-09-7	1,000	1,200	µg/L	40MW3	3/3	54 - 54	1,200	--	--	520,000	RDA	N	BSL
Potassium, Total	7440-09-7	1,000	1,200	µg/L	40MW3	3/3	54 - 54	1,200	--	--	520,000	RDA	N	BSL
Selenium, Dissolved	7782-49-2	1.1	1.3	µg/L	40MW3	2/3	0.92 - 0.92	1.3	N	18.25	50	MCL	N	BSL
Selenium, Total	7782-49-2	0.93	0.93	µg/L	40MW5 DUP AVG	1/3	0.92 - 0.92	0.93	N	18.25	50	MCL	N	BSL
Sodium, Dissolved	7440-23-5	6,850	7,800	µg/L	40MW3	3/3	84 - 84	7,800	--	--	130,000	RDA	N	BSL
Sodium, Total	7440-23-5	6,950	7,600	µg/L	40MW3	3/3	84 - 84	7,600	--	--	130,000	RDA	N	BSL
Vanadium, Dissolved	7440-62-2	1.1575	1.1575	µg/L	40MW5 DUP AVG	1/3	0.83 - 0.83	1.1575	N	3.65	--	--	N	BSL
Zinc, Dissolved	7440-66-6	3.1	4.7	µg/L	40MW6	3/3	0.84 - 0.84	4.7	N	1,095	--	--	N	BSL
Zinc, Total	7440-66-6	10.5	15	µg/L	40MW3	3/3	0.84 - 0.84	15	N	1,095	--	--	N	BSL
Pesticides (ug/L)														
gamma-BHC (Lindane)	58-89-9	0.0098	0.0098	µg/L	40MW6	1/3	0.0018 - 0.0018	0.0098	C	0.0515	--	--	N	BSL
TCL VOCs (ug/L)														
Acetone	67-64-1	1.6	1.6	µg/L	40MW6	1/3	1.2 - 1.2	1.6	N	547.5	--	--	N	BSL
Chloroform	67-66-3	19	24	µg/L	40MW6	3/3	0.061 - 0.061	24	C	0.155	80	MCL	Y	**ARBC**
Toluene	108-88-3	0.09	0.09	µg/L	40MW5 DUP AVG	1/3	0.072 - 0.072	0.09	N	227.1	--	--	N	BSL
TCL SVOCs (ug/L)														
1,1'-Biphenyl	92-52-4	0.033	0.033	µg/L	40MW5 DUP AVG	1/3	0.015 - 0.015	0.033	N	30.42	--	--	N	BSL
2-Methylnaphthalene	91-57-6	0.102	0.102	µg/L	40MW5 DUP AVG	1/3	0.015 - 0.015	0.102	N	2.43	--	--	N	BSL
Butylbenzylphthalate	85-68-7	0.038	0.057	µg/L	40MW3	2/3	0.029 - 0.029	0.057	N	730	--	--	N	BSL
Diethylphthalate	84-66-2	0.0275	0.038	µg/L	40MW3	2/3	0.034 - 0.034	0.038	N	2920	--	--	N	BSL
Naphthalene	91-20-3	0.097	0.097	µg/L	40MW5 DUP AVG	1/3	0.023 - 0.023	0.097	N	0.651	--	--	N	BSL

Notes:

CAS = Chemical Abstracts Service
µg/L = Microgram Per Liter
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
ARAR = Applicable, Relevant, and Appropriate Requirement
TBC = To-Be-Considered

C = Carcinogenic per EPA RBC Table (October 2007)
N = Noncarcinogenic per EPA RBC Table (October 2007)
[1] = RBC for Chromium VI used for sceening
[2] = USEPA Drinking Water Action Level used for screening
[3] = RBC for Methylmercury used for screeening
MCL = Maximum Contaminant Level
BSL = Below Tap Water RBC/MCL
DUP AVG = results for duplicate samples averaged
ARBC = Above Tap Water RBC

Table E.1-2.5
SWMU 40 Groundwater Non-detects Screening
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adj. Tap Water RBC	Maximum MDL Exceeds SL
TAL Metals								
Aluminum, Dissolved	7429-90-5	ug/L	3	3	44	44	3,650	N
Aluminum, Total	7429-90-5	ug/L	3	3	44	44	3,650	N
Antimony, Dissolved	7440-36-0	ug/L	3	3	0.44	0.44	1.46	N
Antimony, Total	7440-36-0	ug/L	2	3	0.44	0.44	1.46	N
Arsenic, Dissolved	7440-38-2	ug/L	3	3	0.74	0.74	0.045	**Y**
Arsenic, Total	7440-38-2	ug/L	3	3	0.74	0.74	0.045	**Y**
Beryllium, Dissolved	7440-41-7	ug/L	3	3	0.31	0.31	7.3	N
Beryllium, Total	7440-41-7	ug/L	3	3	0.31	0.31	7.3	N
Cadmium, Dissolved	7440-43-9	ug/L	3	3	0.062	0.062	1.825	N
Cadmium, Total	7440-43-9	ug/L	3	3	0.062	0.062	1.825	N
Lead, Dissolved[1]	7439-92-1	ug/L	3	3	0.33	0.33	15	N
Lead, Total[1]	7439-92-1	ug/L	2	3	0.33	0.33	15	N
Manganese, Dissolved	7439-96-5	ug/L	2	3	0.43	0.43	73	N
Manganese, Total	7439-96-5	ug/L	2	3	0.43	0.43	73	N
Mercury, Dissolved[2]	7439-97-6	ug/L	3	3	0.039	0.039	0.37	N
Mercury, Total[2]	7439-97-6	ug/L	2	3	0.039	0.039	0.37	N
Selenium, Dissolved	7782-49-2	ug/L	1	3	0.92	0.92	18.25	N
Selenium, Total	7782-49-2	ug/L	2	3	0.92	0.92	18.25	N
Silver, Dissolved	7440-22-4	ug/L	3	3	0.12	0.12	18.25	N
Silver, Total	7440-22-4	ug/L	3	3	0.12	0.12	18.25	N
Thallium, Dissolved	7440-28-0	ug/L	3	3	0.17	0.17	0.256	N
Thallium, Total	7440-28-0	ug/L	3	3	0.17	0.17	0.256	N
Vanadium, Dissolved	7440-62-2	ug/L	2	3	0.83	0.83	3.65	N
Vanadium, Total	7440-62-2	ug/L	3	3	0.83	0.83	3.65	N
Pesticides/PCBs								
4,4'-DDD	72-54-8	ug/L	3	3	0.0019	0.0019	0.279	N
4,4'-DDE	72-55-9	ug/L	3	3	0.0027	0.0027	0.197	N
4,4'-DDT	50-29-3	ug/L	3	3	0.002	0.002	0.197	N
Aldrin	309-00-2	ug/L	3	3	0.0079	0.0079	0.004	**Y**
alpha-BHC	319-84-6	ug/L	3	3	0.0019	0.0019	0.011	N
alpha-Chlordane	5103-71-9	ug/L	3	3	0.0021	0.0021	0.191	N
beta-BHC	319-85-7	ug/L	3	3	0.0032	0.0032	0.037	N
delta-BHC	319-86-8	ug/L	3	3	0.0023	0.0023	0.011	N
Dieldrin	60-57-1	ug/L	3	3	0.002	0.002	0.0042	N
Endosulfan I	959-98-8	ug/L	3	3	0.0023	0.0023	21.9	N
Endosulfan II	33213-65-9	ug/L	3	3	0.0018	0.0018	21.9	N
Endosulfan Sulfate	1031-07-8	ug/L	3	3	0.0033	0.0033	21.9	N
Endrin	72-20-8	ug/L	3	3	0.002	0.002	1.095	N
Endrin Aldehyde	7421-93-4	ug/L	3	3	0.0029	0.0029	1.095	N
Endrin Ketone	53494-70-5	ug/L	3	3	0.0033	0.0033	1.095	N
gamma-BHC (Lindane)	58-89-9	ug/L	2	3	0.0018	0.0018	0.052	N
gamma-Chlordane	5103-74-2	ug/L	3	3	0.0021	0.0021	0.191	N
Heptachlor	76-44-8	ug/L	3	3	0.003	0.003	0.015	N
Heptachlor Epoxide	1024-57-3	ug/L	3	3	0.0021	0.0021	0.007	N
Methoxychlor	72-43-5	ug/L	3	3	0.0052	0.0052	18.25	N
Toxaphene	8001-35-2	ug/L	3	3	0.1	0.1	0.061	**Y**
Aroclor 1016[3]	12674-11-2	ug/L	3	3	0.05	0.05	0.255	N
Aroclor 1221	11104-28-2	ug/L	3	3	0.068	0.068	0.033	**Y**
Aroclor 1232	11141-16-5	ug/L	3	3	0.031	0.031	0.033	N
Aroclor 1242	53469-21-9	ug/L	3	3	0.035	0.035	0.033	**Y**
Aroclor 1248	12672-29-6	ug/L	3	3	0.04	0.04	0.033	**Y**
Aroclor 1254	11097-69-1	ug/L	3	3	0.034	0.034	0.033	**Y**
Aroclor 1260	11096-82-5	ug/L	3	3	0.034	0.034	0.033	**Y**
Aroclor 1262	37324-23-5	ug/L	3	3	0.022	0.022	--	NS
Aroclor 1268	11100-14-4	ug/L	3	3	0.049	0.049	--	NS
TCL VOCs								
1,1,1-Trichloroethane	71-55-6	ug/L	3	3	0.11	0.11	913.3	N
1,1,2,2-Tetrachloroethane	79-34-5	ug/L	3	3	0.1	0.1	0.053	**Y**
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/L	3	3	0.14	0.14	5,938	N
1,1,2-Trichloroethane	79-00-5	ug/L	3	3	0.21	0.21	0.188	**Y**
1,1-Dichloroethane	75-34-3	ug/L	3	3	0.076	0.076	89.6	N
1,1-Dichloroethene	75-35-4	ug/L	3	3	0.14	0.14	35.3	N
1,2,3-Trichlorobenzene	87-61-6	ug/L	3	3	0.13	0.13	--	NS
1,2,4-Trichlorobenzene	120-82-1	ug/L	3	3	0.16	0.16	6.08	N
1,2-Dibromo-3-chloropropane	96-12-8	ug/L	3	3	0.29	0.29	0.0002	**Y**
1,2-Dibromoethane	106-93-4	ug/L	3	3	0.22	0.22	0.0053	**Y**
1,2-Dichlorobenzene	95-50-1	ug/L	3	3	0.065	0.065	26.8	N
1,2-Dichloroethane	107-06-2	ug/L	3	3	0.15	0.15	0.116	**Y**
1,2-Dichloropropane	78-87-5	ug/L	3	3	0.1	0.1	0.257	N
1,3-Dichlorobenzene	541-73-1	ug/L	3	3	0.12	0.12	1.825	N
1,4-Dichlorobenzene	106-46-7	ug/L	3	3	0.13	0.13	0.281	N

Table E.1-2.5
SWMU 40 Groundwater Non-detects Screening
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adj. Tap Water RBC	Maximum MDL Exceeds SL
2-Butanone	78-93-3	ug/L	3	3	0.33	0.33	696.8	N
2-Hexanone	591-78-6	ug/L	3	3	0.42	0.42	--	NS
4-Methyl-2-pentanone	108-10-1	ug/L	3	3	0.38	0.38	627.8	N
Acetone	67-64-1	ug/L	2	3	1.2	1.2	547.5	N
Benzene	71-43-2	ug/L	3	3	0.12	0.12	0.336	N
Bromochloromethane	74-97-5	ug/L	3	3	0.2	0.2	--	NS
Bromodichloromethane	75-27-4	ug/L	3	3	0.19	0.19	0.17	**Y**
Bromoform	75-25-2	ug/L	3	3	0.23	0.23	8.48	N
Bromomethane	74-83-9	ug/L	3	3	0.19	0.19	0.852	N
Carbon Disulfide	75-15-0	ug/L	3	3	0.28	0.28	104.3	N
Carbon Tetrachloride	56-23-5	ug/L	3	3	0.15	0.15	0.162	N
Chlorobenzene	108-90-7	ug/L	3	3	0.12	0.12	8.96	N
Chloroethane	75-00-3	ug/L	3	3	0.2	0.2	3.64	N
Chloroform	67-66-3	ug/L	0	3	0	0	0.155	N
Chloromethane	74-87-3	ug/L	3	3	0.06	0.06	18.98	N
cis-1,2-Dichloroethene	156-59-2	ug/L	3	3	0.17	0.17	6.083	N
cis-1,3-Dichloropropene	10061-01-5	ug/L	3	3	0.14	0.14	0.436	N
Cyclohexane	110-82-7	ug/L	3	3	0.14	0.14	1241	N
Dibromochloromethane	124-48-1	ug/L	3	3	0.14	0.14	0.126	**Y**
Dichlorodifluoromethane	75-71-8	ug/L	3	3	0.17	0.17	34.76	N
Ethylbenzene	100-41-4	ug/L	3	3	0.13	0.13	133.99	N
Isopropylbenzene	98-82-8	ug/L	3	3	0.12	0.12	65.82	N
Methyl Acetate	79-20-9	ug/L	3	3	0.16	0.16	608.3	N
Methyl tert-Butyl Ether	1634-04-4	ug/L	3	3	0.096	0.096	2.64	N
Methylcyclohexane	108-87-2	ug/L	3	3	0.15	0.15	627.8	N
Methylene Chloride	75-09-2	ug/L	3	3	0.051	0.051	4.10	N
Styrene	100-42-5	ug/L	3	3	0.11	0.11	162.3	N
Tetrachloroethene	127-18-4	ug/L	3	3	0.15	0.15	0.104	**Y**
Toluene	108-88-3	ug/L	2	3	0.072	0.072	227.1	N
trans-1,2-Dichloroethene	156-60-5	ug/L	3	3	0.16	0.16	10.61	N
trans-1,3-Dichloropropene	10061-02-6	ug/L	3	3	0.16	0.16	0.436	N
Trichloroethene	79-01-6	ug/L	3	3	0.17	0.17	0.026	**Y**
Trichlorofluoromethane	75-69-4	ug/L	3	3	0.18	0.18	128.8	N
Vinyl Chloride	75-01-4	ug/L	3	3	0.17	0.17	0.015	**Y**
Xylenes (Total)	1330-20-7	ug/L	3	3	0.36	0.36	21.26	N
TCL SVOCs								
1,1'-Biphenyl	92-52-4	ug/L	2	3	0.015	0.015	30.42	N
1,2,4,5-Tetrachlorobenzene	95-94-3	ug/L	3	3	0.024	0.024	1.095	N
2,3,4,6-Tetrachlorophenol	58-90-2	ug/L	3	3	0.16	0.16	109.5	N
2,4,5-Trichlorophenol	95-95-4	ug/L	3	3	0.11	0.11	365	N
2,4,6-Trichlorophenol [4]	88-06-2	ug/L	3	3	0.027	0.027	3.6	N
2,4-Dichlorophenol	120-83-2	ug/L	3	3	0.015	0.015	10.95	N
2,4-Dimethylphenol	105-67-9	ug/L	3	3	0.33	0.33	73	N
2,4-Dinitrophenol	51-28-5	ug/L	3	3	1.5	1.5	7.3	N
2,4-Dinitrotoluene	121-14-2	ug/L	3	3	0.21	0.21	7.3	N
2,6-Dinitrotoluene	606-20-2	ug/L	3	3	0.05	0.05	3.65	N
2-Chloronaphthalene	91-58-7	ug/L	3	3	0.012	0.012	48.67	N
2-Chlorophenol	95-57-8	ug/L	3	3	0.016	0.016	3.042	N
2-Methylnaphthalene	91-57-6	ug/L	2	3	0.015	0.015	2.433	N
2-Methylphenol	95-48-7	ug/L	3	3	0.14	0.14	182.5	N
2-Nitroaniline	88-74-4	ug/L	3	3	0.12	0.12	--	NS
2-Nitrophenol	88-75-5	ug/L	3	3	0.026	0.026	--	NS
3,3'-Dichlorobenzidine	91-94-1	ug/L	3	3	0.21	0.21	0.149	**Y**
3-Nitroaniline	99-09-2	ug/L	3	3	0.13	0.13	--	NS
4,6-Dinitro-2-methylphenol	534-52-1	ug/L	3	3	0.12	0.12	--	NS
4-Bromophenyl-PhenylEther	101-55-3	ug/L	3	3	0.026	0.026	--	NS
4-Chloro-3-methylphenol	59-50-7	ug/L	3	3	0.021	0.021	--	NS
4-Chloroaniline	106-47-8	ug/L	3	3	0.021	0.021	14.6	N
4-Chlorophenyl-PhenylEther	7005-72-3	ug/L	3	3	0.016	0.016	--	NS
4-Methylphenol	106-44-5	ug/L	3	3	0.16	0.16	18.25	N
4-Nitroaniline	100-01-6	ug/L	3	3	0.14	0.14	--	NS
4-Nitrophenol	100-02-7	ug/L	3	3	1.3	1.3	--	NS
Acenaphthene	83-32-9	ug/L	3	3	0.013	0.013	36.5	N
Acenaphthylene[5]	208-96-8	ug/L	3	3	0.012	0.012	18.25	N
Acetophenone	98-86-2	ug/L	3	3	0.043	0.043	60.8	N
Anthracene	120-12-7	ug/L	3	3	0.014	0.014	182.5	N
Atrazine	1912-24-9	ug/L	3	3	0.026	0.026	0.304	N
Benzaldehyde	100-52-7	ug/L	3	3	0.051	0.051	365	N
Benzo(a)anthracene	56-55-3	ug/L	3	3	0.037	0.037	0.03	**Y**
Benzo(a)pyrene	50-32-8	ug/L	3	3	0.023	0.023	0.003	**Y**
Benzo(b)fluoranthene	205-99-2	ug/L	3	3	0.04	0.04	0.03	**Y**
Benzo(g,h,i)perylene[5]	191-24-2	ug/L	3	3	0.022	0.022	18.25	N

Table E.1-2.5
SWMU 40 Groundwater Non-detects Screening
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adj. Tap Water RBC	Maximum MDL Exceeds SL
Benzo(k)fluoranthene	207-08-9	ug/L	3	3	0.036	0.036	0.3	N
Bis(2-chloroethoxy)methane	111-91-1	ug/L	3	3	0.016	0.016	--	NS
Bis(2-chloroethyl)Ether	111-44-4	ug/L	3	3	0.016	0.016	0.0096	**Y**
Bis(2-chloroisopropyl)Ether	108-60-1	ug/L	3	3	0.047	0.047	0.26	N
Bis(2-ethylhexyl)Phthalate	117-81-7	ug/L	3	3	0.41	0.41	4.78	N
ButylBenzylPhthalate	85-68-7	ug/L	1	3	0.029	0.029	730	N
Caprolactam	105-60-2	ug/L	3	3	0.14	0.14	1,825	N
Carbazole	86-74-8	ug/L	3	3	0.018	0.018	3.35	N
Chrysene	218-01-9	ug/L	3	3	0.02	0.02	3	N
Di-n-butylphthalate	84-74-2	ug/L	3	3	0.38	0.38	365	N
Di-n-octylphthalate	117-84-0	ug/L	3	3	0.34	0.34	--	NS
Dibenz(a,h)anthracene	53-70-3	ug/L	3	3	0.026	0.026	0.003	**Y**
Dibenzofuran	132-64-9	ug/L	3	3	0.016	0.016	3.65	N
Diethylphthalate	84-66-2	ug/L	1	3	0.034	0.034	2,920	N
Dimethylphthalate	131-11-3	ug/L	3	3	0.016	0.016	--	NS
Fluoranthene	206-44-0	ug/L	3	3	0.016	0.016	146	N
Fluorene	86-73-7	ug/L	3	3	0.011	0.011	24.33	N
Hexachlorobenzene	118-74-1	ug/L	3	3	0.019	0.019	0.042	N
Hexachlorobutadiene	87-68-3	ug/L	3	3	0.018	0.018	0.859	N
Hexachlorocyclopentadiene	77-47-4	ug/L	3	3	0.13	0.13	21.9	N
Hexachloroethane[6]	67-72-1	ug/L	3	3	0.038	0.038	3.65	N
Indeno(1,2,3-cd)pyrene	193-39-5	ug/L	3	3	0.014	0.014	0.03	N
Isophorone	78-59-1	ug/L	3	3	0.031	0.031	70.5	N
N-Nitrosodiphenylamine	86-30-6	ug/L	3	3	0.019	0.019	13.67	N
N-Nitrosodi-n-propylamine	621-64-7	ug/L	3	3	0.03	0.03	0.0096	**Y**
Naphthalene	91-20-3	ug/L	2	3	0.023	0.023	0.651	N
Nitrobenzene	98-95-3	ug/L	3	3	0.026	0.026	0.353	N
Pentachlorophenol	87-86-5	ug/L	3	3	0.19	0.19	0.558	N
Phenanthrene[5]	85-01-8	ug/L	3	3	0.015	0.015	18.25	N
Phenol	108-95-2	ug/L	3	3	0.028	0.028	1095	N
Pyrene	129-00-0	ug/L	3	3	0.047	0.047	18.25	N
Explosives								
1,3,5-Trinitrobenzene	99-35-4	ug/L	3	3	0.045	0.045	109.5	N
1,3-Dinitrobenzene	99-65-0	ug/L	3	3	0.071	0.071	0.365	N
2,4-Dinitrotoluene	121-14-2	ug/L	3	3	0.092	0.092	7.3	N
2,6-Dinitrotoluene	606-20-2	ug/L	3	3	0.16	0.16	3.65	N
2,4,6-Trinitrotoluene[7]	118-96-7	ug/L	3	3	0.1	0.1	1.83	N
2-Amino-4,6-dinitrotoluene	355-72-78-2	ug/L	3	3	0.24	0.24	7.3	N
2-Nitrotoluene	88-72-2	ug/L	3	3	0.28	0.28	6.083	N
3-Nitrotoluene	99-08-1	ug/L	3	3	0.17	0.17	--	NS
4-Amino-2,6-dinitrotoluene	1946-51-0	ug/L	3	3	0.22	0.22	7.3	N
4-Nitrotoluene	99-99-0	ug/L	3	3	0.49	0.49	4.186	N
HMX	2691-41-0	ug/L	3	3	0.2	0.2	182.5	N
Nitrobenzene	98-95-3	ug/L	3	3	0.15	0.15	0.353	N
RDX	121-82-4	ug/L	3	3	0.092	0.092	0.609	N
Tetryl	479-45-8	ug/L	3	3	0.15	0.15	14.6	N
Nitroglycerin/PETN								
Nitroglycerin	55-63-0	ug/L	3	3	0.58	0.58	0.365	**Y**
PETN	78-11-5	ug/L	3	3	0.61	0.61	--	NS

Notes:

CAS = Chemical Abstracts Service
ug/L = Microgram per liter
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
PETN = Pentaerythritol Tetranitrate
MDL = Method Detection Limit
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available

[1] = Lead Action Level used for screening
[2] = Tap Water RBC for methylmercury used for screening
[3] = Noncarcinogenic Tap Water RBC value for Aroclor 1016 used for screening
[4] = Noncarcinogenic Tap Water RBC value for 2,4,6-Trichlorophenol used for screening
[5] = Tap Water RBC value for pyrene used for screening
[6] = Noncarcinogenic Tap Water RBC value for Hexachloroethane used for screening
[7] = Noncarcinogenic Tap Water RBC values for 2,4,6-Trinitrotoluene used for screening

Table E.1-3.1
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Exposure to Contaminants in SWMU 40 Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Surface Soil	Aluminum	mg/kg	14,470	16,945	28,500	16,945	mg/kg	95% Student's t UCL	ProUCL 4.0
	Arsenic	mg/kg	9.944	25.61	55	25.61	mg/kg	95% Chebyshev (Mean,Sd) UCL	ProUCL 4.0
	Chromium	mg/kg	22.86	25.95	37.6	25.95	mg/kg	95% Student's t UCL	ProUCL 4.0
	Cobalt	mg/kg	6.771	7.819	13.2	7.819	mg/kg	95% Student's t UCL	ProUCL 4.0
	Iron	mg/kg	22,272	30,115	32,000	30,115	mg/kg	95% Chebyshev (Mean,Sd) UCL	ProUCL 4.0
	Manganese	mg/kg	333.9	416.2	894	416.2	mg/kg	95% Student's t UCL	ProUCL 4.0
	Thallium	mg/kg	0.895	0.687	1.3	0.69	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Vanadium	mg/kg	39.97	55.35	56.9	55.35	mg/kg	95% Chebyshev (Mean,Sd) UCL	ProUCL 4.0
	Aroclor 1254	mg/kg	0.216	0.523	2.1	0.523	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Aroclor 1260	mg/kg	0.0874	0.0546	0.23	0.0546	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2-Hexanone*	mg/kg	--	--	0.002	0.002	mg/kg	--	--
	4-Methyl-2-Pentanone	mg/kg	0.013	0.0128	0.031	0.0128	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Chloromethane	mg/kg	0.002	0.0014	0.003	0.0014	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Cyclohexane*	mg/kg	--	--	0.003	0.003	mg/kg	--	--
	Methylcyclohexane	mg/kg	0.011	0.00594	0.027	0.00594	mg/lkg	95% KM (t) UCL	ProUCL 4.0
	Di-n-octyl-phthalate	mg/kg	0.169	0.176	0.5	0.1762	mg/lkg	95% KM (t) UCL	ProUCL 4.0
	Benzo(a)anthracene	mg/kg	0.0763	0.0998	0.39	0.0998	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Benzo(a)pyrene	mg/kg	0.0585	0.12	0.3	0.12	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Benzo(b)fluoranthene	mg/kg	0.113	0.262	0.57	0.262	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Dibenz(a,h)anthracene	mg/kg	0.0495	0.0368	0.11	0.0368	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Indeno(1,2,3-cd)pyrene	mg/kg	0.0972	0.0931	0.25	0.0931	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,3,7,8-TCDD TEQ**	mg/kg	--	--	7.00E-06	7.00E-06	mg/kg	--	--

Notes:
FOD = frequency of detection
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram
* Due to the low frequency of detection, a mean and UCL were not calculated.
** Due to the sample size (2 samples), a mean and UCL were not calculated.

Table E.1-3.2
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Exposure to Contaminants in SWMU 40 Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Medium: Total Soil
Exposure Medium: Total Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Total Soil	Aluminum	mg/kg	18,223	24,031	47,500	24,031	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	Antimony	mg/kg	1.006	1.129	6.1	1.13	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Arsenic	mg/kg	10.72	20.57	74.6	20.57	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Cadmium	mg/kg	0.76	1.191	7.6	1.191	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Chromium	mg/kg	33.84	53.3	234	53.3	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	Cobalt	mg/kg	7.72	8.525	24.85	8.53	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Copper	mg/kg	1,098	7,568	52,000	7,568	mg/kg	97.5% KM (Chebyshev) UCL	ProUCL 4.0
	Iron	mg/kg	28,215	37,114	98,100	37,114	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	Manganese	mg/kg	364.6	407.6	952	407.6	mg/kg	95% Student's t UCL	ProUCL 4.0
	Mercury	mg/kg	0.673	1.604	11	1.604	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Thallium	mg/kg	0.556	0.406	1.3	0.406	mg/kg	95% KM (t)) UCL	ProUCL 4.0
	Vanadium	mg/kg	44	48.31	95.2	48.31	mg/kg	95% Student's t UCL	ProUCL 4.0
	Zinc	mg/kg	389.8	2,342	16,000	2,342	mg/kg	97.5% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	Aroclor 1242	mg/kg	2.437	3.483	17	3.483	mg/kg	99% KM (Chebyshev) UCL	ProUCL 4.0
	Aroclor 1254	mg/kg	0.550	0.882	5	0.882	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Aroclor 1260	mg/kg	0.165	0.0872	0.66	0.0872	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2-Hexanone*	mg/kg	--	--	0.002	0.002	mg/kg	--	--
	4-Methyl-2-Pentanone	mg/kg	0.0133	0.00956	0.031	0.00956	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Chloromethane	mg/kg	0.002	0.00117	0.003	0.00117	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Cyclohexane	mg/kg	0.038	0.0408	0.145	0.0408	mg/kg	99% KM (Chebyshev) UCL	ProUCL 4.0
	Methylcyclohexane	mg/kg	0.0452	0.105	0.41	0.105	mg/kg	99% KM (Chebyshev) UCL	ProUCL 4.0
	Di-n-octylphthalate	mg/kg	0.2689	0.171	1.145	0.171	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Benzo(a)anthracene	mg/kg	0.492	0.643	3.8	0.643	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Benzo(a)pyrene	mg/kg	0.1029	0.0984	0.9	0.0984	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Benzo(b)fluoranthene	mg/kg	0.1285	0.118	0.57	0.1180	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Dibenzo(a,h)anthracene	mg/kg	0.0598	0.0286	0.11	0.0286	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Indeno-(1,2,3-cd)pyrene	mg/kg	0.1644	0.0831	0.65	0.0831	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Nitroglycerin*	mg/kg	--	--	1.30E+02	1.30E+02	mg/kg	--	--
	Total Equivalents 2,3,7,8-TCDD**	mg/kg	--	--	9.07E-06	9.07E-06	mg/kg	--	--

Notes:
FOD = frequency of detection
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram
* Due to the low frequency of detection, a mean and UCL were not calculated.
** Due to the sample size (3 samples), a mean and UCL were not calculated.

Table E.1-4.1a
Values used for Daily Intake Equations for Current/Future Scenario - Surface Soil - Exposure Medium Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Maintenance Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
Dermal Absorption *	Maintenance Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) Fraction ingested assumed 100%.

*See Table E.1-4.3 for chemical specific dermal absorption fractions

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

cm^2 = square centimeter

USEPA = U.S. Environmental Protection Agency

EPC = Exposure Point Concentration

Table E.1-4.1b
Values used for Daily Intake Equations for Current/Future Scenario - Surface Soil - Exposure Medium Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Maintenance Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.5	m^3/hr	USEPA, 1989	
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	(2)	
			Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/VF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.5	m^3/hr	USEPA, 1991	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) PEFs provided on Table E.1-4.4

(3) VFs provided on Table E.1-4.3

USEPA, 1989. Risk Assessment Guidance for Superfund Volume I - Human Health Evaluation Manual (Part A). Interim Final. EPA/540/1-89/002.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

m^3/hour = cubic meters per hour

USEPA = U.S. Environmental Protection Agency

Table E.1-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Maintenance Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
	Construction Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	330	mg/day	USEPA, 2002	
	Commercial Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	50	mg/day	USEPA, 2002	
	Resident	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
		Child	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	200	mg/day	USEPA, 1991	

Table E.1-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption *	Maintenance Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Construction Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.3	mg/(cm^2-event)	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 2002	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Commercial Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Resident	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.07	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	5,700	cm^2	USEPA, 2004	

Table E.1-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption Cont.*	Resident Cont.	Child	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	$CDI\ (mg/kg\text{-}day) = \frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				AF	Soil-to-Skin Adherence Factor	0.2	$mg/(cm^2\text{-event})$	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	2,800	cm^2	USEPA, 2004	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) Fraction ingested assumed 100%.

*See Table E.1-4.3 for chemical specific dermal absorption fractions

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

cm^2 = square centimeter

USEPA = U.S. Environmental Protection Agency

EPC = Exposure Point Concentration

Table E.1-4.1d
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Maintenance Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.5	m^3/hr	USEPA, 1989	
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	(2)	
			Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/VF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.5	m^3/hr	USEPA, 1991	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	
	Construction Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	2.5	m^3/hr	USEPA, 1991	
				PEF	Particulate Emission Factor	1.17E+06	m^3/kg	(2)	
			Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/VF}{BW \times AT}$
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	2.5	m^3/hr	USEPA, 1991	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	
	Commercial Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.0	m^3/hr	USEPA, 1989	
				PEF	Particulate Emission Factor	6.61E+08	m^3/kg	(2)	

Table E.1-4.1d
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation Cont.	Commercial Worker Cont.	Adult Cont.	Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/VF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.0	m^3/hr	USEPA, 1989	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	
			Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Air	Chemical Specific	mg/kg	(4)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.0	m^3/hr	USEPA, 1989	
	Resident	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	2	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.83	m^3/hr	(5)	
				PEF	Particulate Emission Factor	6.61E+08	m^3/kg	(2)	
			Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/VF}{BW \times AT}$
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	2	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.83	m^3/hr	(5)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	
			Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CA	Chemical Concentration in Air	Chemical Specific	mg/kg	(4)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET}{BW \times AT}$
				ED	Exposure Duration	16.4	years	USEPA, 1997	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	24	hr/day	USEPA, 1991	
				IR	Inhalation Rate	0.83	m^3/hr	(5)	

Table E.1-4.1d
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation Cont.	Resident Cont.	Child	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	6	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.5	m^3/hr	(6)	
				PEF	Particulate Emission Factor	6.61E+08	m^3/kg	(2)	
			Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/VF}{BW \times AT}$
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	6	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.5	m^3/hr	(6)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	
			Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CA	Chemical Concentration in Air	Chemical Specific	mg/kg	(4)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET}{BW \times AT}$
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	18	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.5	m^3/hr	(6)	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.
(2) PEFs provided on Table E.1-4.4
(3) VFs provided on Table E.1-4.3
(4) Chemical Concentration in Air for Indoor Vapors calculated using Johnson and Ettinger Model. See Table E.1-4.5
(5) The inhalation rate is calculated using a daily long term rate of 20 m^3/day (USEPA, 1991) divided by 24 hours to derive hourly inhalation rate of 0.83 m^3/hour.
(6) The inhalation rate is calculated using a daily long term rate of 12 m^3/day (USEPA, 2003) divided by 24 hours to derive hourly inhalation rate of 0.5 m^3/hour.

USEPA, 1989. Risk Assessment Guidance for Superfund Volume I - Human Health Evaluation Manual (Part A). Interim Final. EPA/540/1-89/002.
USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.
USEPA, 1997. Exposure Factors Handbook. Office of Research and Development. EPA/600/P-95/002Fa through Fc.
USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

kg/mg = Kilogram Per Millogram
mg/kg = Milligram Per Kilogram
hr/day = hour per day
m^3/hour = cubic meters per hour
USEPA = U.S. Environmental Protection Agency

Table E.1-4.2a
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Commercial Worker	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	1	L/day	USEPA, 1991	
	Resident	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	2	L/day	USEPA, 1991	
		Child	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	1	L/day	USEPA, 1991	
Dermal Absorption*	Commercial Worker	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$ *where*
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	*Organics:*
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	if $t_{event} \le t^*$, $DA_{event} = 2 \times CF1 \times CF2 \times FA \times Kp \times CW \times [(6 \times \tau_{event} \times t_{event})/\pi]^{1/2}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	if $t_{event} > t^*$, $DA_{event} = CF1 \times CF2 \times FA \times Kp \times CW \times [(t_{event}/(1+B))+ 2 \times \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	800	cm^2	(2)	*Inorganics:*
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	$DA_{event} = CF1 \times CF2 \times Kp \times CW \times t_{event}$
				t_{event}	Event Duration	1	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	

Table E.1-4.2a
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption Continued*	Resident	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$ *where*
				BW	Body Weight	70	kg	USEPA, 1991	*Organics:*
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	if $t_{event} \le t^*$, DA_{event} = 2 x CF1 x CF2 x FA x Kp x CW x $[(6 x \tau_{event} x t_{event})/\pi]^{1/2}$
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	24	years	USEPA, 1991	if $t_{event} > t^*$, DA_{event} = CF1 x CF2 x FA x Kp x CW x $[(t_{event}/(1+B))+ 2 x \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	*Inorganics:*
				SA	Skin Surface Area Available for Contact	18,000	cm^2	USEPA, 2004	DA_{event} = CF1 x CF2 x Kp x CW x t_{event}
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	
				t_{event}	Event Duration	0.58	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	
		Child	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$ *where*
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	*Organics:*
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	if $t_{event} \le t^*$, DA_{event} = 2 x CF1 x CF2 x FA x Kp x CW x $[(6 x \tau_{event} x t_{event})/\pi]^{1/2}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	if $t_{event} > t^*$, DA_{event} = CF1 x CF2 x FA x Kp x CW x $[(t_{event}/(1+B))+ 2 x \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	6,600	cm^2	USEPA, 2004	*Inorganics:*
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	DA_{event} = CF1 x CF2 x Kp x CW x t_{event}
				t_{event}	Event Duration	1	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	

Table E.1-4.2a
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

(1) Best Professional Judgement. Based on the head, hands, and forearms.

(2) Best Professional Judgement. Based on the mean surface area for hands for men and women.

*See Table E.1-4.6 for chemical specific parameters used to calculate absorbed dose per event

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final.

VDEQ, 2006. Voluntary Remediation Program Risk Assessment Guidance. www.deq.virginia.gov/vrprisk/raguide.html.

kg = Kilogram

ug/L = Microgram Per Liter

mg/kg = milligram per kilogram

cm^2 = square centimeter

cm^3 = Cubic Centimeter

L/day = liter/day

USEPA = U.S. Environmental Protection Agency

VDEQ = Virginia Department of Environmental Quality

EPC = Exposure Point Concentration

Table E.1-4.2b
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Construction Worker	Adult	Trench Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USUSEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USUSEPA, 1991	
				BW	Body Weight	70	kg	USUSEPA, 1991	
				CA	Chemical Concentration in Outdoor Air	calculated	mg/m^3	(1)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET \times FI}{BW \times AT}$
				ED	Exposure Duration	1	years	USUSEPA, 1991	
				EF	Exposure Frequency	125	days/year	VDEQ, 2006	
				ET	Exposure Time	8	hr/day	USUSEPA, 1991	
				IR	Inhalation Rate	2.5	m^3/hr	USUSEPA, 2002	
				FI	Fraction of Exposure, Air	1	unitless	(2)	
	Commercial Worker	Adult	Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CA	Chemical Concentration in Indoor Air	calculated	mg/m^3	(3)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET \times FI}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.0	m^3/hr	USEPA, 1997	
				FI	Fraction of Exposure, Air	1	unitless	(2)	
	Resident	Adult	Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CA	Chemical Concentration in Indoor Air	calculated	mg/m^3	(3)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET \times FI}{BW \times AT}$
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	16.4	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.83	m^3/hr	(4)	
				FI	Fraction of Exposure, Air	1	unitless	(2)	
			Vapors while showering with groundwater	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	10,950	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CA	Chemical Concentration in Shower Air	calculated	mg/m^3	(5)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET \times FI}{BW \times AT}$
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	0.261	hr/day	(6)	
				IR	Inhalation Rate	0.83	m^3/hr	USEPA, 1997	
				FI	Fraction of Exposure, Air	1	unitless	(2)	

Table E.1-4.2b
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation Cont.	Resident Cont.	Child	Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CA	Chemical Concentration in Indoor Air	calculated	mg/m^3	(3)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET \times FI}{BW \times AT}$
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	18	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.5	m^3/hr	(7)	
				FI	Fraction of Exposure, Air	1	unitless	(2)	

Notes:

(1) See Table E.1-4.9 for trench air calculations.

(2) Best Professional Judgement. Based on 100% inhalation fraction.

(3) Chemical Concentration in Air for Indoor Vapors calculated using Johnson and Ettinger Model (See Table E.1-4.7).

(4) The inhalation rate is calculated using a daily long term rate of 20 m^3/day (USEPA, 1991) divided by 24 hours to derive hourly inhalation rate of 0.83 m^3/hour.

(5) Chemical Concentration in Air for Vapors while showering with groundwater calculated using Foster and Chrostowski Inhalation Model (See Table E.1-4.8).

(6) ET calculated using ET=(Ds+((exp(-Ra*t))/Ra - ((exp(Ra(Ds-t))/Ra)))*1hr/60min

Ds (shower time) =	30	min
t (total time in shower room) =	60	min
Ra (air exchange rate) =	0.01667	per min
ET=	0.261	hour/day

(7) The inhalation rate is calculated using a daily long term rate of 12 m^3/day (USEPA, 2003) divided by 24 hours to derive hourly inhalation rate of 0.5 m^3/hour.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 1997. Exposure Factors Handbook. Office of Research and Development. EPA/600/P-95/002Fa.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

VDEQ, 2006. Voluntary Remediation Program Risk Assessment Guidance. www.deq.virginia.gov/vrprisk/raguide.html.

kg = Kilogram
ug/L = Microgram Per Liter
mg/kg = milligram per kilogram
cm^3 = Cubic Centimeter
L/day = liter/day
USEPA = U.S. Environmental Protection Agency
VDEQ = Virginia Department of Environmental Quality

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Table E.1-4.3.RME
Dermal Absorption Fractions and Volatilization Factors for Soil - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	ABSd * (m^3/kg)	D_l (cm^2/s)	D_w (cm^2/s)	K_{oc} (cm^3/g)	K_d (cm^3/g)	H (unitless)	Da (cm^2/sec)	$VF_{C/I\ Worker}$/ $VF_{Maint.\ Worker}$ (m^3/kg)	$VF_{Const.\ Worker}$ (m^3/kg)	$VF_{Adult\ Resident}$ (m^3/kg)	$VF_{Child\ Resident}$ (m^3/kg)
Aluminum	7429-90-5	1.00E-02	--	--	--	--	--	--	--	--	--	--
Antimony	7440-36-0	1.00E-02	--	--	--	--	--	--	--	--	--	--
Arsenic	7440-38-2	3.00E-02	--	--	--	--	--	--	--	--	--	--
Cadmium	7440-43-9	1.00E-03	--	--	--	--	--	--	--	--	--	--
Chromium	7440-47-3	1.00E-02	--	--	--	--	--	--	--	--	--	--
Cobalt	7440-48-4	1.00E-02	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	1.00E-02	--	--	--	--	--	--	--	--	--	--
Iron	7439-89-6	1.00E-02	--	--	--	--	--	--	--	--	--	--
Manganese	7439-96-5	1.00E-02	--	--	--	--	--	--	--	--	--	--
Mercury	7439-97-6	1.00E-02	--	--	--	--	--	--	--	--	--	--
Thallium	7440-28-0	1.00E-02	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	1.00E-02	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	1.00E-02	--	--	--	--	--	--	--	--	--	--
								--				
Aroclor 1242	53469-21-9	1.40E-01	--	--	--	--	--	--	--	--	--	--
Aroclor 1254	11097-69-1	1.40E-01	--	--	--	--	--	--	--	--	--	--
Aroclor 1248	11096-82-5	1.40E-01	--	--	--	--	--	--	--	--	--	--
2-Hexanone	591-78-6	3.00E-02	7.04E-02	8.44E-06	1.48E+01	1.66E-01	3.82E-03	5.39E-05	1.03E+04	2.70E+03	1.01E+04	5.04E+03
4-Methyl-2-Pentanone	108-10-1	3.00E-02	7.50E-02	7.80E-06	1.05E+01	1.17E-01	5.66E-03	1.04E-04	7.42E+03	1.95E+03	7.27E+03	3.63E+03
Chloromethane	74-87-3	5.00E-04	1.26E-01	6.50E-06	6.30E+00	7.05E-02	3.62E-01	1.02E-02	7.50E+02	1.97E+02	7.34E+02	3.67E+02
Cyclohexane	110-82-7	5.00E-04	8.39E-02	9.10E-06	6.35E+02	7.11E+00	8.00E+00	4.10E-03	1.18E+03	3.10E+02	1.16E+03	5.78E+02
Methylcyclohexane	108-87-2	3.00E-02	7.00E-02	8.28E-06	8.65E+02	9.69E+00	1.76E+01	5.01E-03	1.07E+03	2.80E+02	1.05E+03	5.23E+02
Di-n-octylphthalate	117-84-0	1.00E-01	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	56-55-3	1.30E-01	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	1.30E-01	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	205-99-2	1.30E-01	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	53-70-3	1.30E-01	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	1.30E-01	--	--	--	--	--	--	--	--	--	--
Nitroglycerin	55-63-0	1.00E-02	--	--	--	--	--	--	--	--	--	--
2,3,7,8-TCDD TEQ	1746-01-6	3.00E-02	--	--	--	--	--	--	--	--	--	--

Notes:
CAS = Chemical Abstract Service
ABS_d = Dermal Absorption Fraction
VF = Volatilization Factor
D_a = Apparent Diffusivity
m^3/kg = cubic meters per kilogram
cm2/s = centimeter squared per second

*ABS_d values are taken from Exhibit 3-4, Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation and Manual, Part E; Supplemental Guidance for Dermal Risk Assessment, July 2004, and Region III Technical Guidance, Assessing Dermal Exposure in Soil, December 1995.

Table E.1-4.3.RME
Dermal Absorption Fractions and Volatilization Factors for Soil - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes continued:

D_a values calculated using the following equation and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

Equation 4-8 from USEPA, 2002:

$D_a = [((\Theta_a^{10/3} \times Di \times H) + (\Theta_w^{10/3} \times D_w))/n^2]/[((\rho_b \times K_d) + \Theta_w + (\Theta_a \times H)]$

Θ_a (L_{air}/L_{soil}) =	0.28	default
Θ_w (L_{water}/L_{soil}) =	0.15	default
D_i(cm2/sec) =	varies	
D_w(cm2/sec) =	varies	
H(unitless) =	varies	
n (L_{Pore}/L_{soil}) =	0.43	default
ρ_b (g/cm^3) =	1.50	default
K_d (cm^3/g) =	varies	
K_{oc} (cm^3/g) =	varies	
foc (g/g) =	0.011	

VF (soil only) values for commercial/industrial worker, adult resident, and child resident, and adolescent tresspasser calculated using the following equations and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

Equation 4-8 from USEPA, 2002:

$VF = Q/C_{vol} * (3.14 * D_A * T)^{1/2} * CF/(2 * \rho_b * D_a)$

Q/C_{vol} (g/m2-s)/kg/m3) =	45.57	calculated value
D_A (cm^2/sec) =	varies	chemical specific (see above)
T (sec) =	varies	receptor specific exposure interval (T= ED(yrs)*365 days/year*24 hours/day*60 min/hour*60sec/min)
		(Maintenance Worker=7.88E+08 sec, Commercial/Industrial Worker=7.88E+08 sec, Adult Resident=7.56E+08, and Child Resident=1.89E+08)
CF (m^2/cm^2) =	1.00E-04	default
ρ_b (g/cm^3)	1.5	default

Exhibit D-3 from USEPA, 2002:

$Q/C_{vol} = A * e^{((\ln A_{site} - B)^2/C)}$ =

	45.57	
A =	9.9253	Huntington value
B =	18.6636	Huntington value
C =	211.8862	Huntington value
A_{site} (acres)=	2	contaminated site area

VF (soil only) values for construction worker were calculated using the following equations and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

Equation 5-14 from USEPA 2002:

$VF = Q/C_{sa} * 1/F_D * (3.14 * D_A * T)^{1/2} * CF/(2 * \rho_b * D_A)$

Q/C_{sa} (g/m^2-s)/kg/m^3) =	11.06	calculated value
F_D (unitless) =	0.185	default
D_A (cm^2/sec) =	varies	chemical specific (see above)
T (sec) =	3.15E+07	receptor specific exposure interval (T= ED(yrs)*365 days/year*24 hours/day*60 min/hour*60sec/min)
CF (m^2/cm^2) =	1.00E-04	default
ρ_b (kg/L) =	1.5	default

Equation 5-15 from USEPA, 2002:

$Q/C_{sa} = A * e^{((\ln A_c - B)^2/C)}$ =

	11.06	
A=	2.4538	default
B =	17.566	default
C =	189.0426	default
A_c (acres)=	2	contaminated site area

Table E.1-4.4.RME
PEF Calculations - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Commercial/Industrial Worker

Equation 4-5 from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$PEF = Q / C_{wind} \cdot \frac{3{,}600 s/h}{0.036 \cdot (1-V) \cdot (U_m / U_t)\text{^}3 \cdot F(x)}$$

Parameter	Value	
PEF	6.61E+08	
Q/C_{wind}	45.57	calculated below
V	0.5	default
U_m	4.69	default
U_t	11.32	default
F(x)	0.194	default

PEF = particulate emission factor (m^3/kg)
s/h = seconds per hour
Q/Cwind = Inverse of the ratio of the geometric mean air concentration to the emission flux at the center of a square source (g/m^3-s per kg/m^3)
V = fraction of vegatative cover (unitless)
U_m = mean annual windspeed (m/s)
U_t = equivalent threshold value of windspeed at 7m (m/s)
F(x) = function dependent on U_m/U_t derived using Cowherd et al. (1985)
Site Area = 2

Q/C_{wind} calculated in accordance with Exhibit D-2 from USEPA, 2002 using A, B, and C values for Huntington, WV:
$Q/C_{wind} = A*e\text{^}((\ln A_{site} - B)^2/C))$

Q/C_{wind}=	45.57	
A =	9.9253	unitless
B =	18.6636	unitless
C =	211.8862	unitless
A_{site}=	2	acres

Table E.1-4.4.RME
PEF Calculations - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Construction Worker

Equation 5-5 from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$PEF_{sc} = Q / C_{sr} \cdot \frac{1}{F_D} \cdot \left[\frac{T \cdot A_R}{556 \cdot (W/3)^{0.4} \cdot \frac{(365\ d/yr - p)}{365\ d/yr} \cdot \sum VKT} \right]$$

Parameter	Value	
PEF_{sc}	1.17E+06	
Q/C_{sr}	18.44	calculated
F_D	0.185	default
T (sec)	7,488,000	assumed-see below
A_R (m^2)	548	calculated
W (tons)	8	assumed-see below
p (days/yr)	140	determined-see below
sumVKT (km)	690	assumed-see below

PEF_{sr} = subchronic road particulate emission factor (m^3/kg)
Q/C_{sr} = Inverse of the ratio of the 1-h geometric mean air concentration to the emission flux along a straight road segment bisecting a square site (g/m2-s per kg/m3)
F_D = dispersion correction factor (unitless)
T = total time over which construction occurs-total time period assumed to be 6 months (52wks x 5days per week x 8 hours per day x 3,600 s per hour)
A_R = surface area of contaminated road segment (m^2)
L_R = length of road segment (assumed to equal to (2 acres*43,560 ft^2/acre)$^{1/2}$)
W_R = width of road segment (assumed to be 20 ft)
$A_R = L_R \times W_R \times 0.092903 m^2/ft^2$
A_R= 548 m^2
W = mean vehicle weight assumed to be 8 tons ([(20 cars * 2 tons/car)+(10 trucks*20 tons/truck)]/30 vehicles)
p = number of days with at least 0.01 inches of precipitation (from Exhibit 5-2 140 days/year)
sumVKT = sum of fleet vehicle kilometers traveled during the exposure duration (km)
(30 of vehicles x 0.0885 km/day x 52wks x 5 days/wk)

Q/C_{sr} calculated in accordance with Equation 5-6:
using A, B, and C default values:
$Q/C_{sr} = A*e^{((\ln A_s - B)^2/C)}$

Q/C_{sr}=	18.44	g/m^2-s per kg/m^3
A =	12.9351	unitless
B =	5.7383	unitless
C =	71.7711	unitless
A_s =	2	acres

TABLE E.1-4.5
Soil Inhalation Indoor Air Concentration Summary - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	C_S mg/kg	C_a mg/m^3
2-Hexanone	591-78-6	2.00E-03	1.11E-04
4-Methyl-2-Pentanone	108-10-1	9.56E-03	8.59E-04
Chloromethane	74-87-3	1.17E-03	8.63E-03
Cyclohexane	110-82-7	4.08E-02	3.69E-01
Methylcyclohexane	108-87-2	1.05E-01	1.60E+00

Notes:

Indoor Air Concentrations Modeled Using Johnson and Ettinger Model.

Non-default Model Inputs: Depth below grade to bottom of enclosed floor space (15 cm)
Depth below grade to top of contamination (15 cm)
Soil Type (CL)

Table E.1-4.6
Parameter Values Used for Groundwater - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	FA	Kp (cm/hr)	tau $_{event}$ (hr)	B	t* (hr)
Chloroform	67-66-3	1.0	6.8E-03	5.0E-01	2.9E-02	1.2E+00

Notes:
Organic parameter values are taken from Organic values from Organic Chemicals in Water Spreadsheet
(http://www.epa.gov/oswer/riskassessment/ragse/index.htm)

TABLE E.1-4.7
Groundwater Inhalation Indoor Air Concentration Summary - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	C_W ug/L	C_a mg/m^3
Chloroform	67-66-3	2.40E+01	1.25E-04

Notes:

Indoor Air Concentrations Modeled Using Johnson and Ettinger Model.

Non-default Model Inputs: Depth below grade to bottom of enclosed floor space (15 cm)
Depth below grade to water table (2,743 cm)
Soil Type (CL)

TABLE E.1-4.8
Groundwater Inhalation Shower Stall Air Concentration Calculations - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	C_W ug/L	MW g/mole	H atm-m^3/mole	k_l cm/hour	k_g cm/hour	K_L cm/hour	K_{aL} cm/hour	C_{wd} ug/L	S ug/m^3-min	C_a mg/m^3
Chloroform	67-66-3	2.40E+01	119.4	3.7E-03	12.14	1164.91	1.14E+01	1.52E+01	9.54E+00	3.18E+01	1.91E+00

Equations:

k_l (liquid-film transfer coefficient) = $20*(44/MW)^{0.5}$

k_g (gas-film transfer coefficient) = $3000*(18/MW)^{0.5}$

K_L (overall mass transfer coefficient) = $(1/k_l+(R*t/H*k_g))^{-1}$

K_{aL} (overall mass transfer coefficient adjusted to shower water temperature) = $K_L*((T*u_s/T_s*u_l)^{-0.5}$

C_{wd} (VOC concentration leaving shower droplet) = $C_w*(1-\exp(-K_{aL}*t_s/60*d)$

S (VOC generation rate) = $C_{wd}*FR/SV$

C_a (VOC concentration in shower air) =$(S/R_a)*(1mg/1000ug)$

Constants:

R (gas constant)	8.20E-05	atm-m^3/mole-K
T (room temperature)	298	K
T_s (water temp)	318	K
u_s (water viscosity at T_s)	0.596	centapoise
u_l (water viscosity at T)	1.002	centapoise
t_s (shower droplet drop time)	2	sec
d (droplet diameter)	1	mm
FR (shower flow rate)	20	L/min
SV (shower room air volume)	6	m^3
R_a (air exchange rate)	0.01667	permin

TABLE E.1-4.9
Groundwater Inhalation Construction Worker Trench Gas Concentration Calculations - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	C_W ug/L	H_i atm-m^3/mole	D_{air} cm^2/sec	VF L/m^3	C_a mg/m^3
Chloroform	67-66-3	2.40E+01	3.67E-03	1.04E-01	1.39E-03	3.33E-05

Notes:

Exposure-point Concentrations calculated using VDEQ VRP Model for construction/utility workers in a trench: deep Goundwater greater than 15 feet

Equations:

$VF = (H_i * D_{air} * AC_{vad}^{3.33} * A * F * CF1 * CF2 * CF3)/(R * T * L_d * ACH * V * Por_{vad}^2)$

$C_a = C_W * VF * CF4$

Constants:

H_i (Henry's Law Constant)	chem spec	atm-m^3/mol
D_{air} (diffusion coefficient in air)	chem spec	cm^2/s
AC_{vad} (volumetric air content in vadose zone soil)	0.25	cm^3/cm^3
L (length of trench)	2.44	m
W (width of trench)	0.91	m
A (area of trench - L*W)	2.23	m^2
F (fraction of floor through which contaminant can enter)	1	untiless
R (gas constant)	8.2E-05	atm-m^3/mole-K
T (average system absolute temp)	298	K
L_d (dist. b/w trench bottom and groundwater)	2,268	cm
d (depth of trench)	4.57	m
V (volume of trench)	10.19	m^3
ACH (air changes per hour)	2	per hour
Por_{vad} (total soil porosity in vadose zone)	0.44	cm^3/cm^3
CF1	0.001	L/cm^3
CF2	10,000	cm^2/m^2
CF3	3600	sec/hour
CF4	0.001	mg/ug

Table E.1-5.1
Non-Cancer Toxicity Data - Oral/Dermal - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s)
Aluminum	7429-90-5	Chronic	1.00E+00	mg/kg-day	1	1.00E+00	mg/kg-day	developmental CNS	100	PPRTV	07/26/2001
Antimony	7440-36-0	Chronic	4.00E-04	mg/kg-day	0.15	6.00E-05	mg/kg-day	blood	1000	IRIS	10/22/2007
Antimony	7440-36-0	Subchronic	2.00E-04	mg/kg-day	0.15	3.00E-05	mg/kg-day	blood	300	PPRTV	07/26/1999
Arsenic	7440-38-2	Chronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	skin/ vascular	3	IRIS	10/22/2007
Arsenic	7440-38-2	Subchronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	skin	3	HEAST	07/31/1997
Cadmium	7440-43-9	Chronic	1.00E-03	mg/kg-day	0.025	2.50E-05	mg/kg-day	kidney	10	IRIS	10/22/2007
Chromium(2)	7440-47-3	Chronic	3.00E-03	mg/kg-day	0.025	7.50E-05	mg/kg-day	GI tract/fetus/bone marrow/liver	900	IRIS	10/22/2007
Chromium(2)	7440-47-3	Subchronic	2.00E-02	mg/kg-day	0.025	5.00E-04	mg/kg-day	GI tract/fetus/bone marrow/liver	100	HEAST	07/31/1997
Cobalt	7440-48-4	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	blood	10	PPRTV	01/15/2002
Copper	7440-50-8	Chronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	GI tract	NA	HEAST	07/31/1997
Copper	7440-50-8	Subchronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	GI tract	NA	HEAST	07/31/1997
Iron	7439-89-6	Chronic	7.00E-01	mg/kg-day	1	7.00E-01	mg/kg-day	blood/ liver/ GI tract	1	PPTRV	01/05/1999
Manganese	7439-96-5	Chronic	2.00E-02	mg/kg-day	0.04	8.00E-04	mg/kg-day	CNS	1	IRIS	10/22/2007
Mercury(3)	7439-97-6	Chronic	3.00E-04	mg/kg-day	0.07	2.10E-04	mg/kg-day	immune system	1000	IRIS	10/22/2007
Thallium	7440-28-0	Chronic	7.00E-05	mg/kg-day	1	7.00E-05	mg/kg-day	liver/ blood/ hair	3000	Other, Region III	10/11/2007
Vanadium	7440-62-2	Chronic	1.00E-03	mg/kg-day	0.026	2.60E-05	mg/kg-day	kidney	NA	NCEA, Region III	10/25/2005
Vanadium	7440-62-2	Subchronic	7.00E-03	mg/kg-day	0.026	1.80E-04	mg/kg-day	kidney/ blood	100	HEAST	07/31/1997
Zinc	7440-66-6	Chronic	3.00E-01	mg/kg-day	1	3.00E-01	mg/kg-day	blood	3	IRIS	10/22/2007
Zinc	7440-66-6	Subchronic	3.00E-01	mg/kg-day	1	3.00E-01	mg/kg-day	blood	3	HEAST	07/31/1997
Aroclor 1242	53469-21-9	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Aroclor 1254	11097-69-1	Chronic	2.00E-05	mg/kg-day	1	2.00E-05	mg/kg-day	eyes	300	IRIS	10/22/2007
Aroclor 1254	11097-69-1	Subchronic	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	immune system	100	HEAST	07/31/1997
Aroclor 1260	11096-82-5	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Chloroform	67-66-3	Chronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	liver	100	IRIS	10/22/2007
Chloroform	67-66-3	Subchronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	liver	1000	HEAST	07/31/1997
2-Hexanone	591-78-6	Chronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	CNS	NA	NCEA, Region III	10/11/2007
4-Methyl-2-Pentanone	108-10-1	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Chloromethane	74-87-3	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Cyclohexane	110-82-7	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Di-n-oxtylphthalate	117-84-0	Chronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	liver/thyroid	1000	PPRTV	09/11/2002
Di-n-oxtylphthalate	117-84-0	Subchronic	4.00E-01	mg/kg-day	1	4.00E-01	mg/kg-day	liver/thyroid	100	PPRTV	09/11/2002
Benzo(a)anthracene	56-55-3	NA	NA	NA	1	NA	NA	NA	NA	PPTRV, Region III	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	1	NA	NA	NA	NA	IRIS	NA
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	1	NA	NA	NA	NA	NCEA, Region III	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	1	NA	NA	NA	NA	NCEA, Region III	NA
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	NA	1	NA	NA	NA	NA	NCEA, Region III	NA
Nitroglycerin	55-63-0	Chronic	1.00E-04	mg/kg-day	1	1.00E-04	mg/kg-day	vascular	NA	PPRTV, Region III	04/10/2007
2,3,7,8-TCDD TEQ	1746-01-6	NA	NA	NA	1	NA	NA	NA	NA	NA	NA

Notes:

CAS = Chemical Abstract Service
RfD = Reference Dose
mg/(kg-d) = milligrams per kilogram day
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available
(1) Oral absorption efficiency for dermal from Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005. 2004.
(2) Chromium VI toxicity value used
(3) Mercuric chloride values used for oral/dermal exposure to soil

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III, and HEAST.
For IRIS values, the date of the IRIS search is provided.
For HEAST values, the date of HEAST is provided.
For Region III values, the date of the Region III RBC Table is provided.
For PPRTV/NCEA, date of paper is provided.

Table E.1-5.2
Non-Cancer Toxicity Data - Inhalation - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units	Value	Units			Source(s)	Date(s)
Aluminum	7429-90-5	Chronic	1.00E-03	mg/m3	1.00E-03	mg/kg-day	CNS	300	PPRTV, Region III	10/11/2007
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	Subchronic	4.00E-04	mg/m3	0.00011	mg/kg-day	lungs	100	PPRTV	07/26/1999
Arsenic	7440-38-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	7440-43-9	Chronic	2.00E-04	mg/m3	5.70E-05	mg/kg-day	respiratory	NA	NCEA	03/20/1996
Chromium[(1)]	7440-47-3	Chronic	1.00E-04	mg/m3	2.90E-05	mg/kg-day	respiratory	300	IRIS	10/22/2007
Cobalt	7440-48-4	Chronic	2.00E-05	mg/m3	5.70E-06	mg/kg-day	respiratory	100	PPRTV	01/15/2002
Copper	7440-50-8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	Chronic	5.00E-05	mg/m3	1.43E-05	mg/kg-day	CNS	1000	IRIS	10/22/2007
Mercury	7439-97-6	Chronic	3.00E-04	mg/m3	8.60E-05	mg/kg-day	CNS	30	IRIS	10/22/2007
Mercury	7439-97-6	Subchronic	3.00E-04	mg/m3	8.60E-05	mg/kg-day	CNS	30	HEAST	07/31/1997
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	53469-21-9	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	67-66-3	Chronic	4.90E-02	mg/m3	1.40E-02	mg/kg-day	liver	NA	NCEA, Region III	10/11/2007
2-Hexanone	591-78-6	Chronic	5.00E-03	mg/m3	1.40E-03	mg/kg-day	CNS	NA	NCEA, Region III	10/11/2007
4-Methyl-2-Pentanone	108-10-1	Chronic	3.00E+00	mg/m3	8.60E-01	mg/kg-day	fetus	300	IRIS	10/22/2007
Chloromethane	74-87-3	Chronic	9.00E-02	mg/m3	2.60E-02	mg/kg-day	brain	NA	IRIS	10/22/2007
Cyclohexane	110-82-7	Chronic	6.00E+00	mg/m3	1.70E+00	mg/kg-day	fetus	300	IRIS	10/22/2007
Methylcyclohexane	108-87-2	Chronic	3.00E+00	mg/m3	8.60E-01	mg/kg-day	kidney	100	HEAST	07/31/1997
Methylcyclohexane	108-87-2	Subchronic	3.00E+00	mg/m3	8.60E-01	mg/kg-day	kidney	100	HEAST	07/31/1997
Di-n-oxtylphthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-oxtylphthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	56-55-3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	55-63-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD TEQ	1746-01-6	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table E.1-5.2
Non-Cancer Toxicity Data - Inhalation - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

RfC = Reference Concentration
RfD = Reference Dose
mg/m^3 = milligrams per cubic meter
mg/(kg-d) = milligrams per kilogram day
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available

(1) Toxicity data for chromium VI particulates
Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III, VDEQ, and HEAST.
For IRIS values, the date of the IRIS search is provided.
For PPRTV values, the date of the paper is provided.
For Region III values, the date of the Region III RBC Table is provided.
For HEAST values, the date of HEAST is provided.

Table E.1-6.1
Cancer Toxicity Data - Oral/Dermal - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
		Value	Units		Value	Units		Source(s)	Date(s)
Aluminum	7429-90-5	NA	NA	1	NA	NA	NA	NA	NA
Antimony	7440-36-0	NA	NA	0.15	NA	NA	NA	NA	NA
Arsenic	7440-38-2	1.50E+00	1/(mg/kg-day)	1	1.50E+00	1/(mg/kg-day)	A	IRIS	10/22/2007
Cadmium	7440-43-9	NA	NA	0.05	NA	NA	NA	NA	NA
Chromium[(2)]	7440-47-3	NA	NA	0.025	NA	NA	Cannot Be Determined	NA	NA
Cobalt	7440-48-4	NA	NA	1	NA	NA	NA	NA	NA
Copper	7440-50-8	NA	NA	1	NA	NA	D	NA	NA
Iron	7439-89-6	NA	NA	1	NA	NA	NA	NA	NA
Manganese	7439-96-5	NA	NA	0.04	NA	NA	D	NA	NA
Mercury	7439-97-6	NA	NA	1	NA	NA	D	NA	NA
Thallium	7440-28-0	NA	NA	1	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	0.026	NA	NA	NA	NA	NA
Zinc	7440-66-6	NA	NA	1	NA	NA	D	NA	NA
Aroclor 1242	53469-21-9	2.00E+00	1/(mg/kg-day)	1	2.00E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Aroclor 1254	11097-69-1	2.00E+00	1/(mg/kg-day)	1	2.00E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Aroclor 1260	11096-82-5	2.00E+00	1/(mg/kg-day)	1	2.00E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Chloroform	67-66-3	NA	NA	1	NA	NA	B2	NA	NA
2-Hexanone	591-78-6	NA	NA	1	NA	NA	NA	NA	NA
4-Methyl-2-Pentanone	108-10-1	NA	NA	1	NA	NA	NA	NA	NA
Chloromethane	74-87-3	NA	NA	1	NA	NA	D	NA	NA
Cyclohexane	110-82-7	NA	NA	1	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	NA	NA	1	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	NA	NA	1	NA	NA	NA	NA	NA
Di-n-oxtylphthalate	117-84-0	NA	NA	1	NA	NA	NA	NA	NA
Di-n-oxtylphthalate	117-84-0	NA	NA	1	NA	NA	NA	NA	NA
Benzo(a)anthracene	56-55-3	7.30E-01	1/(mg/kg-day)	1	7.30E-01	1/(mg/kg-day)	B2	PPTRV, Region III	10/11/2007
Benzo(a)pyrene	50-32-8	7.30E+00	1/(mg/kg-day)	1	7.30E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Benzo(b)fluoranthene	205-99-2	7.30E-01	1/(mg/kg-day)	1	7.30E-01	1/(mg/kg-day)	B2	NCEA, Region III	10/11/2007
Dibenz(a,h)anthracene	53-70-3	7.30E+00	1/(mg/kg-day)	1	7.30E+00	1/(mg/kg-day)	B2	NCEA, Region III	10/11/2007
Indeno(1,2,3-cd)pyrene	193-39-5	7.30E-01	1/(mg/kg-day)	1	7.30E-01	1/(mg/kg-day)	B2	NCEA, Region III	10/11/2007
Nitroglycerin	55-63-0	1.70E-02	1/(mg/kg-day)	1	1.70E-02	1/(mg/kg-day)	C	PPRTV, Region III	10/11/2007
2,3,7,8-TCDD TEQ	1746-01-6	1.50E+05	1/(mg/kg-day)	1	1.50E+05	1/(mg/kg-day)	B2	HEAST	07/31/1997

Table E.1-6.1
Cancer Toxicity Data - Oral/Dermal - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

CSF = Cancer Slope Factor
mg/(kg-d) = Milligrams Per Kilogram Day
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available
Cancer Guideline Description:
A = Human carcinogen
B1 = Probable human carcinogen - indicates that limited human data are available.
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C = Possible human carcinogen
D = Not classifiable as a human carcinogen

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III and VDEQ.
For IRIS values, the date of the IRIS search is provided.
For HEAST values, the date of the HEAST Table is provided.
For Region III values, the date of the Region III RBC Table is provided.

(1) Oral absorption efficiency for dermal from Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. . EPA/540/R/99/005. 2004
(2) Chromium VI toxicity data used.

Table E.1-6.2
Cancer Toxicity Data - Inhalation - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description	CSF	
		Value	Units	Value	Units		Source(s)	Date(s)
Aluminum	7429-90-5	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA
Arsenic	7440-38-2	4.30E+00	1/(mg/m3)	1.50E+01	1/(mg/kg-day)	A	IRIS	10/22/2007
Cadmium	7440-43-9	1.80E+00	1/(mg/m3)	6.30E+00	1/(mg/kg-day)	B1	IRIS	10/22/2007
Chromium(1)	7440-47-3	1.20E+01	1/(mg/m3)	4.10E+01	1/(mg/kg-day)	A	IRIS	10/22/2007
Cobalt	7440-48-4	2.80E+00	1/(mg/m3)	9.80E+00	1/(mg/kg-day)	B2	PPRTV	01/15/2002
Copper	7440-50-8	NA	NA	NA	NA	D	NA	NA
Iron	7439-89-6	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	NA	NA	NA	NA	D	NA	NA
Mercury	7439-97-6	NA	NA	NA	NA	D	NA	NA
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	NA	NA	NA	NA	D	NA	NA
Aroclor 1242	53469-21-9	5.71E-01	1/(mg/m3)	2.00E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Aroclor 1254	11097-69-1	5.71E-01	1/(mg/m3)	2.00E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Aroclor 1260	11096-82-5	5.71E-01	1/(mg/m3)	2.00E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Chloroform	67-66-3	2.31E-02	1/(mg/m3)	8.10E-02	1/(mg/kg-day)	B2	IRIS	10/22/2007
2-Hexanone	591-78-6	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-Pentanone	108-10-1	NA	NA	NA	NA	NA	NA	NA
Chloromethane	74-87-3	NA	NA	NA	NA	D	NA	NA
Cyclohexane	110-82-7	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	NA	NA	NA	NA	NA	NA	NA
Di-n-oxtylphthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA
Di-n-oxtylphthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	56-55-3	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	8.86E-01	1/(mg/m3)	3.10E+00	1/(mg/kg-day)	B2	NCEA, Region III	10/11/2007
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	55-63-0	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD TEQ	1746-01-6	4.29E+04	1/(mg/m3)	1.50E+05	1/(mg/kg-day)	B2	HEAST	07/31/1997

Notes:

CSF = Cancer Slope Factor
mg/(kg-d) = Milligrams Per Kilogram Day
USEPA = U.S. Environmental Protection Agency
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available
(1) = Chromium VI toxicity data used

Cancer Guideline Description:
A = Human carcinogen
B1 = Probable human carcinogen - indicates that limited human data are available.
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C = Possible human carcinogen
D = Not classifiable as a human carcinogen

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III and VDEQ.
For IRIS values, the date of the IRIS search is provided.
For NCEA, Region III values, the date of the Region III RBC Table is provided.
For PPRTV values, the date of the paper is provided.
For HEAST values, the date of the HEAST Table is provided.

TABLE E.1-7.1.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Soil	Soil	Ingestion	Aluminum	1.69E+04	mg/kg	1.18E-03	mg/kg-day	--	--	--	3.32E-03	mg/kg-day	1.00E+00	mg/kg-day	3.3.E-03
				Arsenic	2.56E+01	mg/kg	1.79E-06	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	2.7.E-06	5.01E-06	mg/kg-day	3.00E-04	mg/kg-day	2.E-02
				Chromium	2.60E+01	mg/kg	1.81E-06	mg/kg-day	--	--	--	5.08E-06	mg/kg-day	3.00E-03	mg/kg-day	2.E-03
				Cobalt	7.82E+00	mg/kg	5.46E-07	mg/kg-day	--	--	--	1.53E-06	mg/kg-day	2.00E-02	mg/kg-day	8.E-05
				Iron	3.01E+04	mg/kg	2.10E-03	mg/kg-day	--	--	--	5.89E-03	mg/kg-day	7.00E-01	mg/kg-day	8.E-03
				Manganese	4.16E+02	mg/kg	2.91E-05	mg/kg-day	--	--	--	8.14E-05	mg/kg-day	2.00E-02	mg/kg-day	4.E-03
				Thallium	6.90E-01	mg/kg	4.82E-08	mg/kg-day	--	--	--	1.35E-07	mg/kg-day	7.00E-05	mg/kg-day	2.E-03
				Vanadium	5.54E+01	mg/kg	3.87E-06	mg/kg-day	--	--	--	1.08E-05	mg/kg-day	1.00E-03	mg/kg-day	1.E-02
				Aroclor 1254	5.23E-01	mg/kg	3.66E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	7.3.E-08	1.02E-07	mg/kg-day	2.00E-05	mg/kg-day	5.E-03
				Aroclor 1260	5.46E-02	mg/kg	3.82E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	7.6.E-09	1.07E-08	mg/kg-day	--	--	--
				2-Hexanone	2.00E-03	mg/kg	1.40E-10	mg/kg-day	--	--	--	3.91E-10	mg/kg-day	4.00E-02	mg/kg-day	1.E-08
				4-Methyl-2-Pentanone	1.28E-02	mg/kg	8.95E-10	mg/kg-day	--	--	--	2.50E-09	mg/kg-day	--	--	--
				Chloromethane	1.40E-03	mg/kg	9.78E-11	mg/kg-day	--	--	--	2.74E-10	mg/kg-day	--	--	--
				Cyclohexane	3.00E-03	mg/kg	2.10E-10	mg/kg-day	--	--	--	5.87E-10	mg/kg-day	--	--	--
				Methylcyclohexane	5.94E-03	mg/kg	4.15E-10	mg/kg-day	--	--	--	1.16E-09	mg/kg-day	--	--	--
				Di-n-octylphthalate	1.76E-01	mg/kg	1.23E-08	mg/kg-day	--	--	--	3.44E-08	mg/kg-day	4.00E-02	mg/kg-day	9.E-07
				Benzo(a)anthracene	9.98E-02	mg/kg	6.98E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	5.1.E-09	1.95E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene	1.20E-01	mg/kg	8.39E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	6.1.E-08	2.35E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	2.62E-01	mg/kg	1.83E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	1.3.E-08	5.13E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	3.68E-02	mg/kg	2.57E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.9.E-08	7.20E-09	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	9.31E-02	mg/kg	6.51E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	4.8.E-09	1.82E-08	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	7.00E-06	mg/kg	4.89E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	7.3.E-08	1.37E-12	mg/kg-day	--	--	--
			Exp. Route Total								3.E-06					5.2.E-02
			Dermal Absorption	Aluminum	1.69E+04	mg/kg	3.91E-05	mg/kg-day	--	--	--	1.09E-04	mg/kg-day	1.00E+00	mg/kg-day	1.E-04
				Arsenic	2.56E+01	mg/kg	1.77E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	3.E-07	4.96E-07	mg/kg-day	3.00E-04	mg/kg-day	2.E-03
				Chromium	2.60E+01	mg/kg	5.99E-08	mg/kg-day	--	--	--	1.68E-07	mg/kg-day	7.50E-05	mg/kg-day	2.E-03
				Cobalt	7.82E+00	mg/kg	1.80E-08	mg/kg-day	--	--	--	5.05E-08	mg/kg-day	2.00E-02	mg/kg-day	3.E-06
				Iron	3.01E+04	mg/kg	6.95E-05	mg/kg-day	--	--	--	1.94E-04	mg/kg-day	7.00E-01	mg/kg-day	3.E-04
				Manganese	4.16E+02	mg/kg	9.60E-07	mg/kg-day	--	--	--	2.69E-06	mg/kg-day	8.00E-04	mg/kg-day	3.E-03
				Thallium	6.90E-01	mg/kg	1.59E-09	mg/kg-day	--	--	--	4.46E-09	mg/kg-day	7.00E-05	mg/kg-day	6.E-05
				Vanadium	5.54E+01	mg/kg	1.28E-07	mg/kg-day	--	--	--	3.57E-07	mg/kg-day	2.60E-05	mg/kg-day	1.E-02
				Aroclor 1254	5.23E-01	mg/kg	1.69E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-08	4.73E-08	mg/kg-day	2.00E-05	mg/kg-day	2.E-03
				Aroclor 1260	5.46E-02	mg/kg	1.76E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-09	4.94E-09	mg/kg-day	--	--	--
				2-Hexanone	2.00E-03	mg/kg	1.38E-11	mg/kg-day	--	--	--	3.87E-11	mg/kg-day	4.00E-02	mg/kg-day	1.E-09
				4-Methyl-2-Pentanone	1.28E-02	mg/kg	8.86E-11	mg/kg-day	--	--	--	2.48E-10	mg/kg-day	--	--	--
				Chloromethane	1.40E-03	mg/kg	1.61E-13	mg/kg-day	--	--	--	4.52E-13	mg/kg-day	--	--	--
				Cyclohexane	3.00E-03	mg/kg	3.46E-13	mg/kg-day	--	--	--	9.69E-13	mg/kg-day	--	--	--
				Methylcyclohexane	5.94E-03	mg/kg	4.11E-11	mg/kg-day	--	--	--	1.15E-10	mg/kg-day	--	--	--
				Di-n-octylphthalate	1.76E-01	mg/kg	4.06E-09	mg/kg-day	--	--	--	1.14E-08	mg/kg-day	4.00E-02	mg/kg-day	3.E-07
				Benzo(a)anthracene	9.98E-02	mg/kg	2.99E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	2.E-09	8.38E-09	mg/kg-day	--	--	--
				Benzo(a)pyrene	1.20E-01	mg/kg	3.60E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	3.E-08	1.01E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	2.62E-01	mg/kg	7.86E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	6.E-09	2.20E-08	mg/kg-day	--	--	--

TABLE E.1-7.1.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil Cont.	Soi Cont.	Soil Cont.	Dermal	Dibenz(a,h)anthrancene	3.68E-02	mg/kg	1.10E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	8.E-09	3.09E-09	mg/kg-day	--	--	--
			Absorption	Indeno(1,2,3-cd)pyrene	9.31E-02	mg/kg	2.79E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	2.E-09	7.82E-09	mg/kg-day	--	--	--
			Cont.	2,3,7,8-TCDD TEQ	7.00E-06	mg/kg	4.84E-14	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	7.E-09	1.36E-13	mg/kg-day	--	--	--
			Exp. Route Total								4.E-07					2.4.E-02
		Exposure Point Total									3.E-06					8.E-02
	Exposure Medium Total										3.E-06					8.E-02
	Air	Fugitive Dust	Inhalation	Aluminum	1.69E+04	mg/kg	2.15E-07	mg/kg-day	--	--	--	6.02E-07	mg/kg-day	1.00E-03	mg/kg-day	6.E-04
				Arsenic	2.56E+01	mg/kg	3.25E-10	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	5.E-09	9.10E-10	mg/kg-day	--	--	--
				Chromium	2.60E+01	mg/kg	3.29E-10	mg/kg-day	4.10E+01	mg/kg-day $^{-1}$	1.E-08	9.23E-10	mg/kg-day	2.90E-05	mg/kg-day	3.E-05
				Cobalt	7.82E+00	mg/kg	9.93E-11	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	1.E-09	2.78E-10	mg/kg-day	5.70E-06	mg/kg-day	5.E-05
				Iron	3.01E+04	mg/kg	3.82E-07	mg/kg-day	--	--	--	1.07E-06	mg/kg-day	--	--	--
				Manganese	4.16E+02	mg/kg	5.28E-09	mg/kg-day	--	--	--	1.48E-08	mg/kg-day	1.43E-05	mg/kg-day	1.E-03
				Thallium	6.90E-01	mg/kg	8.76E-12	mg/kg-day	--	--	--	2.45E-11	mg/kg-day	--	--	--
				Vanadium	5.54E+01	mg/kg	7.03E-10	mg/kg-day	--	--	--	1.97E-09	mg/kg-day	--	--	--
				Aroclor 1254	5.23E-01	mg/kg	6.64E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-11	1.86E-11	mg/kg-day	--	--	--
				Aroclor 1260	5.46E-02	mg/kg	6.93E-13	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-12	1.94E-12	mg/kg-day	--	--	--
				2-Hexanone	2.00E-03	mg/kg	2.54E-14	mg/kg-day	--	--	--	7.11E-14	mg/kg-day	1.40E-03	mg/kg-day	5.E-11
				4-Methyl-2-Pentanone	1.28E-02	mg/kg	1.63E-13	mg/kg-day	--	--	--	4.55E-13	mg/kg-day	8.60E-01	mg/kg-day	5.E-13
				Chloromethane	1.40E-03	mg/kg	1.78E-14	mg/kg-day	--	--	--	4.98E-14	mg/kg-day	2.60E-02	mg/kg-day	2.E-12
				Cyclohexane	3.00E-03	mg/kg	3.81E-14	mg/kg-day	--	--	--	1.07E-13	mg/kg-day	1.70E+00	mg/kg-day	6.E-14
				Methylcyclohexane	5.94E-03	mg/kg	7.54E-14	mg/kg-day	--	--	--	2.11E-13	mg/kg-day	8.60E-01	mg/kg-day	2.E-13
				Di-n-octylphthalate	1.76E-01	mg/kg	2.23E-12	mg/kg-day	--	--	--	6.26E-12	mg/kg-day	--	--	--
				Benzo(a)anthracene	9.98E-02	mg/kg	1.27E-12	mg/kg-day	--	--	--	3.55E-12	mg/kg-day	--	--	--
				Benzo(a)pyrene	1.20E-01	mg/kg	1.52E-12	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	5.E-12	4.27E-12	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	2.62E-01	mg/kg	3.33E-12	mg/kg-day	--	--	--	9.31E-12	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	3.68E-02	mg/kg	4.67E-13	mg/kg-day	--	--	--	1.31E-12	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	9.31E-02	mg/kg	1.18E-12	mg/kg-day	--	--	--	3.31E-12	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	7.00E-06	mg/kg	8.89E-17	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.E-11	2.49E-16	mg/kg-day	--	--	--
			Exp. Route Total								2.E-08					2.E-03
		Exposure Point Total									2.E-08					2.E-03
		Outdoor Vapors	Inhalation	2-Hexanone	0.002	mg/kg	1.63E-09	mg/kg-day	--	--	--	4.56E-09	mg/kg-day	1.40E-03	mg/kg-day	3.E-06
				4-Methyl-2-Pentanone	0.0128	mg/kg	1.45E-08	mg/kg-day	--	--	--	4.05E-08	mg/kg-day	8.60E-01	mg/kg-day	5.E-08
				Chloromethane	0.0014	mg/kg	1.57E-08	mg/kg-day	--	--	--	4.39E-08	mg/kg-day	2.60E-02	mg/kg-day	2.E-06
				Cyclohexane	0.003	mg/kg	2.13E-08	mg/kg-day	--	--	--	5.97E-08	mg/kg-day	1.70E+00	mg/kg-day	4.E-08
				Methylcyclohexane	0.00594	mg/kg	4.67E-08	mg/kg-day	--	--	--	1.31E-07	mg/kg-day	8.60E-01	mg/kg-day	2.E-07
			Exp. Route Total								--					5.E-06
		Exposure Point Total									--					5.E-06
	Exposure Medium Total										2.E-08					2.E-03
Soil Total											3.E-06					8.E-02
										Total of Receptor Risks Across All Media	3.E-06			Total of Receptor Hazards Across All Media		8.E-02

TABLE E.1-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	2.40E+04	mg/kg	1.68E-03	mg/kg-day	--	--	--	4.70E-03	mg/kg-day	1.00E+00	mg/kg-day	4.7.E-03
				Antimony	1.13E+00	mg/kg	7.90E-08	mg/kg-day	--	--	--	2.21E-07	mg/kg-day	4.00E-04	mg/kg-day	6.E-04
				Arsenic	2.06E+01	mg/kg	1.44E-06	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	2.2.E-06	4.03E-06	mg/kg-day	3.00E-04	mg/kg-day	1.E-02
				Cadmium	1.19E+00	mg/kg	8.32E-08	mg/kg-day	--	--	--	2.33E-07	mg/kg-day	1.00E-03	mg/kg-day	2.E-04
				Chromium	5.33E+01	mg/kg	3.73E-06	mg/kg-day	--	--	--	1.04E-05	mg/kg-day	3.00E-03	mg/kg-day	3.E-03
				Cobalt	8.53E+00	mg/kg	5.96E-07	mg/kg-day	--	--	--	1.67E-06	mg/kg-day	2.00E-02	mg/kg-day	8.E-05
				Copper	7.57E+03	mg/kg	5.29E-04	mg/kg-day	--	--	--	1.48E-03	mg/kg-day	4.00E-02	mg/kg-day	4.E-02
				Iron	3.71E+04	mg/kg	2.59E-03	mg/kg-day	--	--	--	7.26E-03	mg/kg-day	7.00E-01	mg/kg-day	1.E-02
				Manganese	4.08E+02	mg/kg	2.85E-05	mg/kg-day	--	--	--	7.98E-05	mg/kg-day	2.00E-02	mg/kg-day	4.E-03
				Mercury	1.60E+00	mg/kg	1.12E-07	mg/kg-day	--	--	--	3.14E-07	mg/kg-day	3.00E-04	mg/kg-day	1.E-03
				Thallium	4.06E-01	mg/kg	2.84E-08	mg/kg-day	--	--	--	7.95E-08	mg/kg-day	7.00E-05	mg/kg-day	1.E-03
				Vanadium	4.83E+01	mg/kg	3.38E-06	mg/kg-day	--	--	--	9.45E-06	mg/kg-day	1.00E-03	mg/kg-day	9.E-03
				Zinc	2.34E+03	mg/kg	1.64E-04	mg/kg-day	--	--	--	4.58E-04	mg/kg-day	3.00E-01	mg/kg-day	2.E-03
				Aroclor 1242	3.48E+00	mg/kg	2.43E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.9.E-07	6.82E-07	mg/kg-day	--	--	--
				Aroclor 1254	8.82E-01	mg/kg	6.16E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.2.E-07	1.73E-07	mg/kg-day	2.00E-05	mg/kg-day	9.E-03
				Aroclor 1260	8.72E-02	mg/kg	6.09E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.2.E-08	1.71E-08	mg/kg-day	--	--	--
				2-Hexanone	2.00E-03	mg/kg	1.40E-10	mg/kg-day	--	--	--	3.91E-10	mg/kg-day	4.00E-02	mg/kg-day	1.E-08
				4-Methyl-2-Pentanone	9.56E-03	mg/kg	6.68E-10	mg/kg-day	--	--	--	1.87E-09	mg/kg-day	--	--	--
				Chloromethane	1.17E-03	mg/kg	8.18E-11	mg/kg-day	--	--	--	2.29E-10	mg/kg-day	--	--	--
				Cyclohexane	4.08E-02	mg/kg	2.85E-09	mg/kg-day	--	--	--	7.98E-09	mg/kg-day	--	--	--
				Methylcyclohexane	1.05E-01	mg/kg	7.34E-09	mg/kg-day	--	--	--	2.05E-08	mg/kg-day	--	--	--
				Di-n-octylphthalate	1.71E-01	mg/kg	1.20E-08	mg/kg-day	--	--	--	3.35E-08	mg/kg-day	4.00E-02	mg/kg-day	8.E-07
				Benzo(a)anthracene	6.43E-01	mg/kg	4.49E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	3.3.E-08	1.26E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	9.84E-02	mg/kg	6.88E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	5.0.E-08	1.93E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	1.18E-01	mg/kg	8.25E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	6.0.E-09	2.31E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	2.86E-02	mg/kg	2.00E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.5.E-08	5.60E-09	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	8.31E-02	mg/kg	5.81E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	4.2.E-09	1.63E-08	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	6.34E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	9.5.E-08	1.77E-12	mg/kg-day	--	--	--
				Nitroglycerin	1.30E+02	mg/kg	9.09E-06	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	1.5.E-07	2.54E-05	mg/kg-day	1.00E-04	mg/kg-day	3.E-01
			Exp. Route Total								3.E-06					3.5.E-01
			Dermal Absorption	Aluminum	2.40E+04	mg/kg	5.54E-05	mg/kg-day	--	--	--	1.55E-04	mg/kg-day	1.00E+00	mg/kg-day	2.E-04
				Antimony	1.13E+00	mg/kg	2.61E-09	mg/kg-day	--	--	--	7.30E-09	mg/kg-day	6.00E-05	mg/kg-day	1.E-04
				Arsenic	2.06E+01	mg/kg	1.42E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	2.E-07	3.99E-07	mg/kg-day	3.00E-04	mg/kg-day	1.E-03
				Cadmium	1.19E+00	mg/kg	2.75E-10	mg/kg-day	--	--	--	7.69E-10	mg/kg-day	2.50E-05	mg/kg-day	3.E-05
				Chromium	5.33E+01	mg/kg	1.23E-07	mg/kg-day	--	--	--	3.44E-07	mg/kg-day	7.50E-05	mg/kg-day	5.E-03
				Cobalt	8.53E+00	mg/kg	1.97E-08	mg/kg-day	--	--	--	5.51E-08	mg/kg-day	2.00E-02	mg/kg-day	3.E-06
				Copper	7.57E+03	mg/kg	1.75E-05	mg/kg-day	--	--	--	4.89E-05	mg/kg-day	4.00E-02	mg/kg-day	1.E-03
				Iron	3.71E+04	mg/kg	8.56E-05	mg/kg-day	--	--	--	2.40E-04	mg/kg-day	7.00E-01	mg/kg-day	3.E-04
				Manganese	4.08E+02	mg/kg	9.40E-07	mg/kg-day	--	--	--	2.63E-06	mg/kg-day	8.00E-04	mg/kg-day	3.E-03
				Mercury	1.60E+00	mg/kg	3.70E-09	mg/kg-day	--	--	--	1.04E-08	mg/kg-day	2.10E-04	mg/kg-day	5.E-05
				Thallium	4.06E-01	mg/kg	9.36E-10	mg/kg-day	--	--	--	2.62E-09	mg/kg-day	7.00E-05	mg/kg-day	4.E-05
				Vanadium	4.83E+01	mg/kg	1.11E-07	mg/kg-day	--	--	--	3.12E-07	mg/kg-day	2.60E-05	mg/kg-day	1.E-02

TABLE E.1-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Soil Cont.	Soil Cont.	Dermal Absorption Cont.	Zinc	2.34E+03	mg/kg	5.40E-06	mg/kg-day	--	--	--	1.51E-05	mg/kg-day	3.00E-01	mg/kg-day	5.E-05
				Aroclor 1242	3.48E+00	mg/kg	1.12E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-07	3.15E-07	mg/kg-day	--	--	--
				Aroclor 1254	8.82E-01	mg/kg	2.85E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	6.E-08	7.97E-08	mg/kg-day	2.00E-05	mg/kg-day	4.E-03
				Aroclor 1260	8.72E-02	mg/kg	2.82E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	6.E-09	7.88E-09	mg/kg-day	--	--	--
				2-Hexanone	2.00E-03	mg/kg	1.38E-11	mg/kg-day	--	--	--	3.87E-11	mg/kg-day	4.00E-02	mg/kg-day	1.E-09
				4-Methyl-2-Pentanone	9.56E-03	mg/kg	6.61E-11	mg/kg-day	--	--	--	1.85E-10	mg/kg-day	--	--	--
				Chloromethane	1.17E-03	mg/kg	1.35E-13	mg/kg-day	--	--	--	3.78E-13	mg/kg-day	--	--	--
				Cyclohexane	4.08E-02	mg/kg	4.71E-12	mg/kg-day	--	--	--	1.32E-11	mg/kg-day	--	--	--
				Methylcyclohexane	1.05E-01	mg/kg	7.27E-10	mg/kg-day	--	--	--	2.03E-09	mg/kg-day	--	--	--
				Di-n-octylphthalate	1.71E-01	mg/kg	3.94E-09	mg/kg-day	--	--	--	1.10E-08	mg/kg-day	4.00E-02	mg/kg-day	3.E-07
				Benzo(a)anthracene	6.43E-01	mg/kg	1.93E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	1.E-08	5.40E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene	9.84E-02	mg/kg	2.95E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	2.E-08	8.26E-09	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	1.18E-01	mg/kg	3.54E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	3.E-09	9.91E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	2.86E-02	mg/kg	8.58E-10	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	6.E-09	2.40E-09	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	8.31E-02	mg/kg	2.49E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	2.E-09	6.98E-09	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	6.27E-14	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	9.E-09	1.76E-13	mg/kg-day	--	--	--
				Nitroglycerin	1.30E+02	mg/kg	3.00E-07	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	5.E-09	8.40E-07	mg/kg-day	1.00E-04	mg/kg-day	8.E-03
			Exp. Route Total								6.E-07					3.6.E-02
		Exposure Point Total									4.E-06					4.E-01
	Exposure Medium Total										4.E-06					4.E-01
	Air	Fugitive Dust	Inhalation	Aluminum	2.40E+04	mg/kg	3.05E-07	mg/kg-day	--	--	--	8.54E-07	mg/kg-day	1.00E-03	mg/kg-day	9.E-04
				Antimony	1.13E+00	mg/kg	1.43E-11	mg/kg-day	--	--	--	4.02E-11	mg/kg-day	--	--	--
				Arsenic	2.06E+01	mg/kg	2.61E-10	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	4.E-09	7.31E-10	mg/kg-day	--	--	--
				Cadmium	1.19E+00	mg/kg	1.51E-11	mg/kg-day	6.30E+00	mg/kg-day $^{-1}$	1.E-10	4.23E-11	mg/kg-day	5.70E-05	mg/kg-day	7.E-07
				Chromium	5.33E+01	mg/kg	6.77E-10	mg/kg-day	4.10E+01	mg/kg-day $^{-1}$	3.E-08	1.89E-09	mg/kg-day	2.90E-05	mg/kg-day	7.E-05
				Cobalt	8.53E+00	mg/kg	1.08E-10	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	1.E-09	3.03E-10	mg/kg-day	5.70E-06	mg/kg-day	5.E-05
				Copper	7.57E+03	mg/kg	9.61E-08	mg/kg-day	--	--	--	2.69E-07	mg/kg-day	--	--	--
				Iron	3.71E+04	mg/kg	4.71E-07	mg/kg-day	--	--	--	1.32E-06	mg/kg-day	--	--	--
				Manganese	4.08E+02	mg/kg	5.18E-09	mg/kg-day	--	--	--	1.45E-08	mg/kg-day	1.43E-05	mg/kg-day	1.E-03
				Mercury	1.60E+00	mg/kg	2.04E-11	mg/kg-day	--	--	--	5.70E-11	mg/kg-day	8.60E-05	mg/kg-day	7.E-07
				Thallium	4.06E-01	mg/kg	5.15E-12	mg/kg-day	--	--	--	1.44E-11	mg/kg-day	--	--	--
				Vanadium	4.83E+01	mg/kg	6.13E-10	mg/kg-day	--	--	--	1.72E-09	mg/kg-day	--	--	--
				Zinc	2.34E+03	mg/kg	2.97E-08	mg/kg-day	--	--	--	8.33E-08	mg/kg-day	--	--	--
				Aroclor 1242	3.48E+00	mg/kg	4.42E-11	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	9.E-11	1.24E-10	mg/kg-day	--	--	--
				Aroclor 1254	8.82E-01	mg/kg	1.12E-11	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-11	3.14E-11	mg/kg-day	--	--	--
				Aroclor 1260	8.72E-02	mg/kg	1.11E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-12	3.10E-12	mg/kg-day	--	--	--
				2-Hexanone	2.00E-03	mg/kg	2.54E-14	mg/kg-day	--	--	--	7.11E-14	mg/kg-day	1.40E-03	mg/kg-day	5.E-11
				4-Methyl-2-Pentanone	9.56E-03	mg/kg	1.21E-13	mg/kg-day	--	--	--	3.40E-13	mg/kg-day	8.60E-01	mg/kg-day	4.E-13
				Chloromethane	1.17E-03	mg/kg	1.49E-14	mg/kg-day	--	--	--	4.16E-14	mg/kg-day	2.60E-02	mg/kg-day	2.E-12
				Cyclohexane	4.08E-02	mg/kg	5.18E-13	mg/kg-day	--	--	--	1.45E-12	mg/kg-day	1.70E+00	mg/kg-day	9.E-13
				Methylcyclohexane	1.05E-01	mg/kg	1.33E-12	mg/kg-day	--	--	--	3.73E-12	mg/kg-day	8.60E-01	mg/kg-day	4.E-12
				Di-n-octylphthalate	1.71E-01	mg/kg	2.17E-12	mg/kg-day	--	--	--	6.08E-12	mg/kg-day	--	--	--

TABLE E.1-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air Cont.	Fugitive Dust Cont.	Inhalation Cont.	Benzo(a)anthracene	6.43E-01	mg/kg	8.16E-12	mg/kg-day	--	--	--	2.29E-11	mg/kg-day	--	--	--
				Benzo(a)pyrene	9.84E-02	mg/kg	1.25E-12	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	4.E-12	3.50E-12	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	1.18E-01	mg/kg	1.50E-12	mg/kg-day	--	--	--	4.20E-12	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	2.86E-02	mg/kg	3.63E-13	mg/kg-day	--	--	--	1.02E-12	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	8.31E-02	mg/kg	1.06E-12	mg/kg-day	--	--	--	2.95E-12	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	1.15E-16	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-11	3.22E-16	mg/kg-day	--	--	--
				Nitroglycerin	1.30E+02	mg/kg	1.65E-09	mg/kg-day	--	--	--	4.62E-09	mg/kg-day	--	--	--
			Exp. Route Total								3.E-08					2.E-03
		Exposure Point Total									3.E-08					2.E-03
		Outdoor Vapors	Inhalation	2-Hexanone	0.002	mg/kg	1.63E-09	mg/kg-day	--	--	--	4.56E-09	mg/kg-day	1.40E-03	mg/kg-day	3.E-06
				4-Methyl-2-Pentanone	0.00956	mg/kg	1.08E-08	mg/kg-day	--	--	--	3.03E-08	mg/kg-day	8.60E-01	mg/kg-day	4.E-08
				Chloromethane	0.00117	mg/kg	1.31E-08	mg/kg-day	--	--	--	3.67E-08	mg/kg-day	2.60E-02	mg/kg-day	1.E-06
				Cyclohexane	0.0408	mg/kg	2.90E-07	mg/kg-day	--	--	--	8.12E-07	mg/kg-day	1.70E+00	mg/kg-day	5.E-07
				Methylcyclohexane	0.105	mg/kg	8.25E-07	mg/kg-day	--	--	--	2.31E-06	mg/kg-day	8.60E-01	mg/kg-day	3.E-06
			Exp. Route Total								--					8.E-06
		Exposure Point Total									--					8.E-06
	Exposure Medium Total										3.E-08					2.E-03
Soil Total											4.E-06					4.E-01
											Total of Receptor Risks Across All Media					Total of Receptor Hazards Across All Media
											4.E-06					4.E-01

TABLE E.1-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	24031	mg/kg	4.20E-03	mg/kg-day	--	--	--	1.18E-02	mg/kg-day	1.00E+00	mg/kg-day	1.E-02
				Antimony	1.13	mg/kg	1.97E-07	mg/kg-day	--	--	--	5.53E-07	mg/kg-day	4.00E-04	mg/kg-day	1.E-03
				Arsenic	20.57	mg/kg	3.59E-06	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	5.E-06	1.01E-05	mg/kg-day	3.00E-04	mg/kg-day	3.E-02
				Cadmium	1.191	mg/kg	2.08E-07	mg/kg-day	--	--	--	5.83E-07	mg/kg-day	1.00E-03	mg/kg-day	6.E-04
				Chromium	53.3	mg/kg	9.31E-06	mg/kg-day	--	--	--	2.61E-05	mg/kg-day	3.00E-03	mg/kg-day	9.E-03
				Cobalt	8.53	mg/kg	1.49E-06	mg/kg-day	--	--	--	4.17E-06	mg/kg-day	2.00E-02	mg/kg-day	2.E-04
				Copper	7568	mg/kg	1.32E-03	mg/kg-day	--	--	--	3.70E-03	mg/kg-day	4.00E-02	mg/kg-day	9.E-02
				Iron	37114	mg/kg	6.48E-03	mg/kg-day	--	--	--	1.82E-02	mg/kg-day	7.00E-01	mg/kg-day	3.E-02
				Manganese	407.6	mg/kg	7.12E-05	mg/kg-day	--	--	--	1.99E-04	mg/kg-day	2.00E-02	mg/kg-day	1.E-02
				Mercury	1.604	mg/kg	2.80E-07	mg/kg-day	--	--	--	7.85E-07	mg/kg-day	3.00E-04	mg/kg-day	3.E-03
				Thallium	0.406	mg/kg	7.09E-08	mg/kg-day	--	--	--	1.99E-07	mg/kg-day	7.00E-05	mg/kg-day	3.E-03
				Vanadium	48.31	mg/kg	8.44E-06	mg/kg-day	--	--	--	2.36E-05	mg/kg-day	1.00E-03	mg/kg-day	2.E-02
				Zinc	2342	mg/kg	4.09E-04	mg/kg-day	--	--	--	1.15E-03	mg/kg-day	3.00E-01	mg/kg-day	4.E-03
				Aroclor 1242	3.483	mg/kg	6.09E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-06	1.70E-06	mg/kg-day	--	--	--
				Aroclor 1254	0.882	mg/kg	1.54E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-07	4.32E-07	mg/kg-day	2.00E-05	mg/kg-day	2.E-02
				Aroclor 1260	0.0872	mg/kg	1.52E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-08	4.27E-08	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	3.49E-10	mg/kg-day	--	--	--	9.78E-10	mg/kg-day	4.00E-02	mg/kg-day	2.E-08
				4-Methyl-2-Pentanone	0.00956	mg/kg	1.67E-09	mg/kg-day	--	--	--	4.68E-09	mg/kg-day	--	--	--
				Chloromethane	0.00117	mg/kg	2.04E-10	mg/kg-day	--	--	--	5.72E-10	mg/kg-day	--	--	--
				Cyclohexane	0.0408	mg/kg	7.13E-09	mg/kg-day	--	--	--	2.00E-08	mg/kg-day	--	--	--
				Methylcyclohexane	0.105	mg/kg	1.83E-08	mg/kg-day	--	--	--	5.14E-08	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.171	mg/kg	2.99E-08	mg/kg-day	--	--	--	8.37E-08	mg/kg-day	4.00E-02	mg/kg-day	2.E-06
				Benzo(a)anthracene	0.643	mg/kg	1.12E-07	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	8.E-08	3.15E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0984	mg/kg	1.72E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.E-07	4.81E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.118	mg/kg	2.06E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	2.E-08	5.77E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.0286	mg/kg	5.00E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	4.E-08	1.40E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	0.0831	mg/kg	1.45E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	1.E-08	4.07E-08	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.068E-06	mg/kg	1.58E-12	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-07	4.44E-12	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	2.27E-05	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	4.E-07	6.36E-05	mg/kg-day	1.00E-04	mg/kg-day	6.E-01
			Exp. Route Total								8.E-06					9.E-01
			Dermal Absorption	Aluminum	24031	mg/kg	2.77E-04	mg/kg-day	--	--	--	7.76E-04	mg/kg-day	1.00E+00	mg/kg-day	8.E-04
				Antimony	1.13	mg/kg	1.30E-08	mg/kg-day	--	--	--	3.65E-08	mg/kg-day	6.00E-05	mg/kg-day	6.E-04
				Arsenic	20.57	mg/kg	7.12E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	1.E-06	1.99E-06	mg/kg-day	3.00E-04	mg/kg-day	7.E-03
				Cadmium	1.191	mg/kg	1.37E-09	mg/kg-day	--	--	--	3.85E-09	mg/kg-day	2.50E-05	mg/kg-day	2.E-04
				Chromium	53.3	mg/kg	6.15E-07	mg/kg-day	--	--	--	1.72E-06	mg/kg-day	7.50E-05	mg/kg-day	2.E-02
				Cobalt	8.53	mg/kg	9.84E-08	mg/kg-day	--	--	--	2.75E-07	mg/kg-day	2.00E-02	mg/kg-day	1.E-05
				Copper	7568	mg/kg	8.73E-05	mg/kg-day	--	--	--	2.44E-04	mg/kg-day	4.00E-02	mg/kg-day	6.E-03
				Iron	37114	mg/kg	4.28E-04	mg/kg-day	--	--	--	1.20E-03	mg/kg-day	7.00E-01	mg/kg-day	2.E-03
				Manganese	407.6	mg/kg	4.70E-06	mg/kg-day	--	--	--	1.32E-05	mg/kg-day	8.00E-04	mg/kg-day	2.E-02
				Mercury	1.604	mg/kg	1.85E-08	mg/kg-day	--	--	--	5.18E-08	mg/kg-day	2.10E-04	mg/kg-day	2.E-04
				Thallium	0.406	mg/kg	4.68E-09	mg/kg-day	--	--	--	1.31E-08	mg/kg-day	7.00E-05	mg/kg-day	2.E-04
				Vanadium	48.31	mg/kg	5.57E-07	mg/kg-day	--	--	--	1.56E-06	mg/kg-day	2.60E-05	mg/kg-day	6.E-02
				Zinc	2342	mg/kg	2.70E-05	mg/kg-day	--	--	--	7.56E-05	mg/kg-day	3.00E-01	mg/kg-day	3.E-04
				Aroclor 1242	3.483	mg/kg	5.62E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-06	1.57E-06	mg/kg-day	--	--	--

TABLE E.1-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Soil Cont.	Soil Cont.	Dermal Absorption Cont.	Aroclor 1254	0.882	mg/kg	1.42E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-07	3.99E-07	mg/kg-day	2.00E-05	mg/kg-day	2.E-02
				Aroclor 1260	0.0872	mg/kg	1.41E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-08	3.94E-08	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	6.92E-11	mg/kg-day	--	--	--	1.94E-10	mg/kg-day	4.00E-02	mg/kg-day	5.E-09
				4-Methyl-2-Pentanone	0.00956	mg/kg	3.31E-10	mg/kg-day	--	--	--	9.26E-10	mg/kg-day	--	--	--
				Chloromethane	0.00117	mg/kg	6.75E-13	mg/kg-day	--	--	--	1.89E-12	mg/kg-day	--	--	--
				Cyclohexane	0.0408	mg/kg	2.35E-11	mg/kg-day	--	--	--	6.59E-11	mg/kg-day	--	--	--
				Methylcyclohexane	0.105	mg/kg	3.63E-09	mg/kg-day	--	--	--	1.02E-08	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.171	mg/kg	1.97E-08	mg/kg-day	--	--	--	5.52E-08	mg/kg-day	4.00E-02	mg/kg-day	1.E-06
				Benzo(a)anthracene	0.643	mg/kg	9.64E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	7.E-08	2.70E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0984	mg/kg	1.48E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.E-07	4.13E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.118	mg/kg	1.77E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	1.E-08	4.95E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.0286	mg/kg	4.29E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	3.E-08	1.20E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	0.0831	mg/kg	1.25E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	9.E-09	3.49E-08	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.068E-06	mg/kg	3.14E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	5.E-08	8.78E-13	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	1.50E-06	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	3.E-08	4.20E-06	mg/kg-day	1.00E-04	mg/kg-day	4.E-02
			Exp. Route Total								3.E-06					2.E-01
		Exposure Point Total									1.E-05					1.E+00
	Exposure Medium Total										1.E-05					1.E+00
	Air	Fugitive Dust	Inhalation	Aluminum	24031	mg/kg	1.02E-06	mg/kg-day	--	--	--	2.85E-06	mg/kg-day	1.00E-03	mg/kg-day	3.E-03
				Antimony	1.13	mg/kg	4.78E-11	mg/kg-day	--	--	--	1.34E-10	mg/kg-day	--	--	--
				Arsenic	20.57	mg/kg	8.71E-10	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	1.E-08	2.44E-09	mg/kg-day	--	--	--
				Cadmium	1.191	mg/kg	5.04E-11	mg/kg-day	6.30E+00	mg/kg-day $^{-1}$	3.E-10	1.41E-10	mg/kg-day	5.70E-05	mg/kg-day	2.E-06
				Chromium	53.3	mg/kg	2.26E-09	mg/kg-day	4.10E+01	mg/kg-day $^{-1}$	9.E-08	6.32E-09	mg/kg-day	2.90E-05	mg/kg-day	2.E-04
				Cobalt	8.53	mg/kg	3.61E-10	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	4.E-09	1.01E-09	mg/kg-day	5.70E-06	mg/kg-day	2.E-04
				Copper	7568	mg/kg	3.20E-07	mg/kg-day	--	--	--	8.97E-07	mg/kg-day	--	--	--
				Iron	37114	mg/kg	1.57E-06	mg/kg-day	--	--	--	4.40E-06	mg/kg-day	--	--	--
				Manganese	407.6	mg/kg	1.73E-08	mg/kg-day	--	--	--	4.83E-08	mg/kg-day	1.43E-05	mg/kg-day	3.E-03
				Mercury	1.604	mg/kg	6.79E-11	mg/kg-day	--	--	--	1.90E-10	mg/kg-day	8.60E-05	mg/kg-day	2.E-06
				Thallium	0.406	mg/kg	1.72E-11	mg/kg-day	--	--	--	4.81E-11	mg/kg-day	--	--	--
				Vanadium	48.31	mg/kg	2.04E-09	mg/kg-day	--	--	--	5.72E-09	mg/kg-day	--	--	--
				Zinc	2342	mg/kg	9.91E-08	mg/kg-day	--	--	--	2.78E-07	mg/kg-day	--	--	--
				Aroclor 1242	3.483	mg/kg	1.47E-10	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-10	4.13E-10	mg/kg-day	--	--	--
				Aroclor 1254	0.882	mg/kg	3.73E-11	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	7.E-11	1.05E-10	mg/kg-day	--	--	--
				Aroclor 1260	0.0872	mg/kg	3.69E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	7.E-12	1.03E-11	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	8.46E-14	mg/kg-day	--	--	--	2.37E-13	mg/kg-day	1.40E-03	mg/kg-day	2.E-10
				4-Methyl-2-Pentanone	0.00956	mg/kg	4.05E-13	mg/kg-day	--	--	--	1.13E-12	mg/kg-day	8.60E-01	mg/kg-day	1.E-12
				Chloromethane	0.00117	mg/kg	4.95E-14	mg/kg-day	--	--	--	1.39E-13	mg/kg-day	2.60E-02	mg/kg-day	5.E-12
				Cyclohexane	0.0408	mg/kg	1.73E-12	mg/kg-day	--	--	--	4.83E-12	mg/kg-day	1.70E+00	mg/kg-day	3.E-12
				Methylcyclohexane	0.105	mg/kg	4.44E-12	mg/kg-day	--	--	--	1.24E-11	mg/kg-day	8.60E-01	mg/kg-day	1.E-11
				Di-n-octylphthalate	0.171	mg/kg	7.24E-12	mg/kg-day	--	--	--	2.03E-11	mg/kg-day	--	--	--
				Benzo(a)anthracene	0.643	mg/kg	2.72E-11	mg/kg-day	--	--	--	7.62E-11	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0984	mg/kg	4.16E-12	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	1.E-11	1.17E-11	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.118	mg/kg	4.99E-12	mg/kg-day	--	--	--	1.40E-11	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.0286	mg/kg	1.21E-12	mg/kg-day	--	--	--	3.39E-12	mg/kg-day	--	--	--

TABLE E.1-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air Cont.	Fugitive Dust Cont.	Inhalation Cont.	Indeno(1,2,3-cd)pyrene	0.0831	mg/kg	3.52E-12	mg/kg-day	--	--	--	9.85E-12	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.068E-06	mg/kg	3.84E-16	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	6.E-11	1.07E-15	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	5.50E-09	mg/kg-day	--	--	--	1.54E-08	mg/kg-day	--	--	--
			Exp. Route Total								1.E-07					7.E-03
		Exposure Point Total									1.E-07					7.E-03
		Outdoor Vapors	Inhalation	2-Hexanone	0.002	mg/kg	5.43E-09	mg/kg-day	--	--	--	1.52E-08	mg/kg-day	1.40E-03	mg/kg-day	1.E-05
				4-Methyl-2-Pentanone	0.00956	mg/kg	3.60E-08	mg/kg-day	--	--	--	1.01E-07	mg/kg-day	8.60E-01	mg/kg-day	1.E-07
				Chloromethane	0.00117	mg/kg	4.36E-08	mg/kg-day	--	--	--	1.22E-07	mg/kg-day	2.60E-02	mg/kg-day	5.E-06
				Cyclohexane	0.0408	mg/kg	9.66E-07	mg/kg-day	--	--	--	2.71E-06	mg/kg-day	1.70E+00	mg/kg-day	2.E-06
				Methylcyclohexane	0.105	mg/kg	2.75E-06	mg/kg-day	--	--	--	7.70E-06	mg/kg-day	8.60E-01	mg/kg-day	9.E-06
			Exp. Route Total								--					3.E-05
		Exposure Point Total									--					3.E-05
		Upward Migration of Vapors from Soil Indoor Air	Inhalation	2-Hexanone	1.11E-04	mg/m^3	3.10E-06	mg/kg-day	--	--	--	8.69E-06	mg/kg-day	1.40E-03	mg/kg-day	6.E-03
				4-Methyl-2-Pentanone	8.59E-04	mg/m^3	2.40E-05	mg/kg-day	--	--	--	6.72E-05	mg/kg-day	8.60E-01	mg/kg-day	8.E-05
				Chloromethane	8.63E-03	mg/m^3	2.41E-04	mg/kg-day	--	--	--	6.76E-04	mg/kg-day	2.60E-02	mg/kg-day	3.E-02
				Cyclohexane	3.69E-01	mg/m^3	1.03E-02	mg/kg-day	--	--	--	2.89E-02	mg/kg-day	1.70E+00	mg/kg-day	2.E-02
				Methylcyclohexane	1.60E+00	mg/m^3	4.47E-02	mg/kg-day	--	--	--	1.25E-01	mg/kg-day	8.60E-01	mg/kg-day	1.E-01
			Exp. Route Total								--					2.E-01
		Exposure Point Total									--					2.E-01
	Exposure Medium Total										1.E-07					2.E-01
Soil Total											1.E-05					1.E+00
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Chloroform	24	ug/L	8.39E-05	mg/kg-day	--	--	--	2.35E-04	mg/kg-day	1.00E-02	mg/kg-day	2.E-02
			Exp. Route Total								--					2.E-02
			Dermal Absorption	Chloroform	24	ug/L	1.28E-07	mg/kg-day	--	--	--	3.58E-07	mg/kg-day	1.00E-02	mg/kg-day	4.E-05
			Exp. Route Total								--					4.E-05
		Exposure Point Total									--					2.E-02
	Exposure Medium Total										--					2.E-02
	Air	Upward Migration of Vapors from Groundwater (Indoor) (1)	Inhalation	Chloroform	1.25E-04	mg/m^3	3.49E-06	mg/kg-day	8.10E-02	mg/kg-day $^{-1}$	3.E-07	9.78E-06	mg/kg-day	1.40E-02	mg/kg-day	7.E-04
			Exp. Route Total								3.E-07					7.E-04
		Exposure Point Total									3.E-07					7.E-04
	Exposure Medium Total										3.E-07					7.E-04
Groundwater Total											3.E-07					2.E-02
											Total of Receptor Risks Across All Media	1.E-05		Total of Receptor Hazards Across All Media		1.E+00

TABLE E.1-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	24031	mg/kg	1.11E-03	mg/kg-day	--	--	--	7.76E-02	mg/kg-day	1.00E+00	mg/kg-day	8.E-02
				Antimony	1.13	mg/kg	5.21E-08	mg/kg-day	--	--	--	3.65E-06	mg/kg-day	2.00E-04	mg/kg-day	2.E-02
				Arsenic	20.57	mg/kg	9.49E-07	mg/kg-day	1.50E+00	mg/kg-day^{-1}	1.E-06	6.64E-05	mg/kg-day	3.00E-04	mg/kg-day	2.E-01
				Cadmium	1.191	mg/kg	5.49E-08	mg/kg-day	--	--	--	3.85E-06	mg/kg-day	1.00E-03	mg/kg-day	4.E-03
				Chromium	53.3	mg/kg	2.46E-06	mg/kg-day	--	--	--	1.72E-04	mg/kg-day	2.00E-02	mg/kg-day	9.E-03
				Cobalt	8.53	mg/kg	3.93E-07	mg/kg-day	--	--	--	2.75E-05	mg/kg-day	2.00E-02	mg/kg-day	1.E-03
				Copper	7568	mg/kg	3.49E-04	mg/kg-day	--	--	--	2.44E-02	mg/kg-day	4.00E-02	mg/kg-day	6.E-01
				Iron	37114	mg/kg	1.71E-03	mg/kg-day	--	--	--	1.20E-01	mg/kg-day	3.00E-01	mg/kg-day	4.E-01
				Manganese	407.6	mg/kg	1.88E-05	mg/kg-day	--	--	--	1.32E-03	mg/kg-day	2.00E-02	mg/kg-day	7.E-02
				Mercury	1.604	mg/kg	7.40E-08	mg/kg-day	--	--	--	5.18E-06	mg/kg-day	3.00E-04	mg/kg-day	2.E-02
				Thallium	0.406	mg/kg	1.87E-08	mg/kg-day	--	--	--	1.31E-06	mg/kg-day	7.00E-05	mg/kg-day	2.E-02
				Vanadium	48.31	mg/kg	2.23E-06	mg/kg-day	--	--	--	1.56E-04	mg/kg-day	7.00E-03	mg/kg-day	2.E-02
				Zinc	2342	mg/kg	1.08E-04	mg/kg-day	--	--	--	7.56E-03	mg/kg-day	3.00E-01	mg/kg-day	3.E-02
				Aroclor 1242	3.483	mg/kg	1.61E-07	mg/kg-day	2.00E+00	mg/kg-day^{-1}	3.E-07	1.12E-05	mg/kg-day	--	--	--
				Aroclor 1254	0.882	mg/kg	4.07E-08	mg/kg-day	2.00E+00	mg/kg-day^{-1}	8.E-08	2.85E-06	mg/kg-day	5.00E-05	mg/kg-day	6.E-02
				Aroclor 1260	0.0872	mg/kg	4.02E-09	mg/kg-day	2.00E+00	mg/kg-day^{-1}	8.E-09	2.82E-07	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	9.23E-11	mg/kg-day	--	--	--	6.46E-09	mg/kg-day	4.00E-02	mg/kg-day	2.E-07
				4-Methyl-2-Pentanone	0.00956	mg/kg	4.41E-10	mg/kg-day	--	--	--	3.09E-08	mg/kg-day	--	--	--
				Chloromethane	0.00117	mg/kg	5.40E-11	mg/kg-day	--	--	--	3.78E-09	mg/kg-day	--	--	--
				Cyclohexane	0.0408	mg/kg	1.88E-09	mg/kg-day	--	--	--	1.32E-07	mg/kg-day	--	--	--
				Methylcyclohexane	0.105	mg/kg	4.84E-09	mg/kg-day	--	--	--	3.39E-07	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.171	mg/kg	7.89E-09	mg/kg-day	--	--	--	5.52E-07	mg/kg-day	4.00E-01	mg/kg-day	1.E-06
				Benzo(a)anthracene	0.643	mg/kg	2.97E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	2.E-08	2.08E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0984	mg/kg	4.54E-09	mg/kg-day	7.30E+00	mg/kg-day^{-1}	3.E-08	3.18E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.118	mg/kg	5.44E-09	mg/kg-day	7.30E-01	mg/kg-day^{-1}	4.E-09	3.81E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.0286	mg/kg	1.32E-09	mg/kg-day	7.30E+00	mg/kg-day^{-1}	1.E-08	9.23E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	0.0831	mg/kg	3.83E-09	mg/kg-day	7.30E-01	mg/kg-day^{-1}	3.E-09	2.68E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	4.18E-13	mg/kg-day	1.50E+05	mg/kg-day^{-1}	6.E-08	2.93E-11	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	6.00E-06	mg/kg-day	1.70E-02	mg/kg-day^{-1}	1.E-07	4.20E-04	mg/kg-day	1.00E-04	mg/kg-day	4.E+00
			Exp. Route Total								2.E-06					6.E+00
			Dermal Absorption	Aluminum	24031	mg/kg	3.33E-05	mg/kg-day	--	--	--	2.33E-03	mg/kg-day	1.00E+00	mg/kg-day	2.E-03
				Antimony	1.13	mg/kg	1.56E-09	mg/kg-day	--	--	--	1.09E-07	mg/kg-day	3.00E-05	mg/kg-day	4.E-03
				Arsenic	20.57	mg/kg	8.54E-08	mg/kg-day	1.50E+00	mg/kg-day^{-1}	1.E-07	5.98E-06	mg/kg-day	3.00E-04	mg/kg-day	2.E-02
				Cadmium	1.191	mg/kg	1.65E-10	mg/kg-day	--	--	--	1.15E-08	mg/kg-day	2.50E-05	mg/kg-day	5.E-04
				Chromium	53.3	mg/kg	7.38E-08	mg/kg-day	--	--	--	5.16E-06	mg/kg-day	5.00E-04	mg/kg-day	1.E-02
				Cobalt	8.53	mg/kg	1.18E-08	mg/kg-day	--	--	--	8.26E-07	mg/kg-day	2.00E-02	mg/kg-day	4.E-05
				Copper	7568	mg/kg	1.05E-05	mg/kg-day	--	--	--	7.33E-04	mg/kg-day	4.00E-02	mg/kg-day	2.E-02
				Iron	37114	mg/kg	5.14E-05	mg/kg-day	--	--	--	3.60E-03	mg/kg-day	3.00E-01	mg/kg-day	1.E-02
				Manganese	407.6	mg/kg	5.64E-07	mg/kg-day	--	--	--	3.95E-05	mg/kg-day	8.00E-04	mg/kg-day	5.E-02
				Mercury	1.604	mg/kg	2.22E-09	mg/kg-day	--	--	--	1.55E-07	mg/kg-day	--	--	--
				Thallium	0.406	mg/kg	5.62E-10	mg/kg-day	--	--	--	3.93E-08	mg/kg-day	7.00E-05	mg/kg-day	6.E-04
				Vanadium	48.31	mg/kg	6.69E-08	mg/kg-day	--	--	--	4.68E-06	mg/kg-day	1.80E-04	mg/kg-day	3.E-02
				Zinc	2342	mg/kg	3.24E-06	mg/kg-day	--	--	--	2.27E-04	mg/kg-day	3.00E-01	mg/kg-day	8.E-04

TABLE E.1-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Soil Cont.	Soil Cont.	Dermal Absorption Cont.	Aroclor 1242	3.483	mg/kg	6.75E-08	mg/kg-day	2.00E+00	mg/kg-day^{-1}	1.E-07	4.72E-06	mg/kg-day	--	--	--
				Aroclor 1254	0.882	mg/kg	1.71E-08	mg/kg-day	2.00E+00	mg/kg-day^{-1}	3.E-08	1.20E-06	mg/kg-day	5.00E-05	mg/kg-day	2.E-02
				Aroclor 1260	0.0872	mg/kg	1.69E-09	mg/kg-day	2.00E+00	mg/kg-day^{-1}	3.E-09	1.18E-07	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	8.30E-12	mg/kg-day	--	--	--	5.81E-10	mg/kg-day	4.00E-02	mg/kg-day	1.E-08
				4-Methyl-2-Pentanone	0.00956	mg/kg	3.97E-11	mg/kg-day	--	--	--	2.78E-09	mg/kg-day	--	--	--
				Chloromethane	0.00117	mg/kg	8.10E-14	mg/kg-day	--	--	--	5.67E-12	mg/kg-day	--	--	--
				Cyclohexane	0.0408	mg/kg	2.82E-12	mg/kg-day	--	--	--	1.98E-10	mg/kg-day	--	--	--
				Methylcyclohexane	0.105	mg/kg	4.36E-10	mg/kg-day	--	--	--	3.05E-08	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.171	mg/kg	2.37E-09	mg/kg-day	--	--	--	1.66E-07	mg/kg-day	4.00E-01	mg/kg-day	4.E-07
				Benzo(a)anthracene	0.643	mg/kg	1.16E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	8.E-09	8.10E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0984	mg/kg	1.77E-09	mg/kg-day	7.30E+00	mg/kg-day^{-1}	1.E-08	1.24E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.118	mg/kg	2.12E-09	mg/kg-day	7.30E-01	mg/kg-day^{-1}	2.E-09	1.49E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.0286	mg/kg	5.15E-10	mg/kg-day	7.30E+00	mg/kg-day^{-1}	4.E-09	3.60E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	0.0831	mg/kg	1.49E-09	mg/kg-day	7.30E-01	mg/kg-day^{-1}	1.E-09	1.05E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	3.76E-14	mg/kg-day	1.50E+05	mg/kg-day^{-1}	6.E-09	2.64E-12	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	1.80E-07	mg/kg-day	1.70E-02	mg/kg-day^{-1}	3.E-09	1.26E-05	mg/kg-day	1.00E-04	mg/kg-day	1.E-01
			Exp. Route Total								3.E-07					3.E-01
		Exposure Point Total									2.E-06					6.E+00
	Exposure Medium Total										2.E-06					6.E+00
	Air	Fugitive Dust	Inhalation	Aluminum	24031	mg/kg	5.75E-05	mg/kg-day	--	--	--	4.02E-03	mg/kg-day	1.00E-03	mg/kg-day	4.0.E+00
				Antimony	1.13	mg/kg	2.70E-09	mg/kg-day	--	--	--	1.89E-07	mg/kg-day	1.10E-04	mg/kg-day	2.E-03
				Arsenic	20.57	mg/kg	4.92E-08	mg/kg-day	1.50E+01	mg/kg-day^{-1}	7.E-07	3.44E-06	mg/kg-day	--	--	--
				Cadmium	1.191	mg/kg	2.85E-09	mg/kg-day	6.30E+00	mg/kg-day^{-1}	2.E-08	1.99E-07	mg/kg-day	5.70E-05	mg/kg-day	3.E-03
				Chromium	53.3	mg/kg	1.27E-07	mg/kg-day	4.10E+01	mg/kg-day^{-1}	5.E-06	8.92E-06	mg/kg-day	2.90E-05	mg/kg-day	3.E-01
				Cobalt	8.53	mg/kg	2.04E-08	mg/kg-day	9.80E+00	mg/kg-day^{-1}	2.E-07	1.43E-06	mg/kg-day	5.70E-06	mg/kg-day	3.E-01
				Copper	7568	mg/kg	1.81E-05	mg/kg-day	--	--	--	1.27E-03	mg/kg-day	--	--	--
				Iron	37114	mg/kg	8.87E-05	mg/kg-day	--	--	--	6.21E-03	mg/kg-day	--	--	--
				Manganese	407.6	mg/kg	9.75E-07	mg/kg-day	--	--	--	6.82E-05	mg/kg-day	1.43E-05	mg/kg-day	5.E+00
				Mercury	1.604	mg/kg	3.84E-09	mg/kg-day	--	--	--	2.68E-07	mg/kg-day	8.60E-05	mg/kg-day	3.E-03
				Thallium	0.406	mg/kg	9.71E-10	mg/kg-day	--	--	--	6.80E-08	mg/kg-day	--	--	--
				Vanadium	48.31	mg/kg	1.16E-07	mg/kg-day	--	--	--	8.09E-06	mg/kg-day	--	--	--
				Zinc	2342	mg/kg	5.60E-06	mg/kg-day	--	--	--	3.92E-04	mg/kg-day	--	--	--
				Aroclor 1242	3.483	mg/kg	8.33E-09	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-08	5.83E-07	mg/kg-day	--	--	--
				Aroclor 1254	0.882	mg/kg	2.11E-09	mg/kg-day	2.00E+00	mg/kg-day^{-1}	4.E-09	1.48E-07	mg/kg-day	--	--	--
				Aroclor 1260	0.0872	mg/kg	2.08E-10	mg/kg-day	2.00E+00	mg/kg-day^{-1}	4.E-10	1.46E-08	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	4.78E-12	mg/kg-day	--	--	--	3.35E-10	mg/kg-day	1.40E-03	mg/kg-day	2.E-07
				4-Methyl-2-Pentanone	0.00956	mg/kg	2.29E-11	mg/kg-day	--	--	--	1.60E-09	mg/kg-day	8.60E-01	mg/kg-day	2.E-09
				Chloromethane	0.00117	mg/kg	2.80E-12	mg/kg-day	--	--	--	1.96E-10	mg/kg-day	2.60E-02	mg/kg-day	8.E-09
				Cyclohexane	0.0408	mg/kg	9.76E-11	mg/kg-day	--	--	--	6.83E-09	mg/kg-day	1.70E+00	mg/kg-day	4.E-09
				Methylcyclohexane	0.105	mg/kg	2.51E-10	mg/kg-day	--	--	--	1.76E-08	mg/kg-day	8.60E-01	mg/kg-day	2.E-08
				Di-n-octylphthalate	0.171	mg/kg	4.09E-10	mg/kg-day	--	--	--	2.86E-08	mg/kg-day	--	--	--
				Benzo(a)anthracene	0.643	mg/kg	1.54E-09	mg/kg-day	--	--	--	1.08E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0984	mg/kg	2.35E-10	mg/kg-day	3.10E+00	mg/kg-day^{-1}	7.E-10	1.65E-08	mg/kg-day	--	--	--

TABLE E.1-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air Cont.	Fugitive Dust Cont,	Inhalation Cont.	Benzo(b)fluoranthene	0.118	mg/kg	2.82E-10	mg/kg-day	--	--	--	1.97E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.0286	mg/kg	6.84E-11	mg/kg-day	--	--	--	4.79E-09	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	0.0831	mg/kg	1.99E-10	mg/kg-day	--	--	--	1.39E-08	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	2.17E-14	mg/kg-day	1.50E+05	$mg/kg\text{-}day^{-1}$	3.E-09	1.52E-12	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	3.11E-07	mg/kg-day	--	--	--	2.18E-05	mg/kg-day	--	--	--
			Exp. Route Total								6.E-06					9.E+00
		Exposure Point Total									6.E-06					9.E+00
		Outdoor Vapors	Inhalation	2-Hexanone	0.002	mg/kg	2.07E-09	mg/kg-day	--	--	--	1.45E-07	mg/kg-day	1.40E-03	mg/kg-day	1.E-04
				4-Methyl-2-Pentanone	0.00956	mg/kg	1.37E-08	mg/kg-day	--	--	--	9.61E-07	mg/kg-day	8.60E-01	mg/kg-day	1.E-06
				Chloromethane	0.00117	mg/kg	1.66E-08	mg/kg-day	--	--	--	1.16E-06	mg/kg-day	2.60E-02	mg/kg-day	4.E-05
				Cyclohexane	0.0408	mg/kg	3.68E-07	mg/kg-day	--	--	--	2.58E-05	mg/kg-day	1.70E+00	mg/kg-day	2.E-05
				Methylcyclohexane	0.105	mg/kg	1.05E-06	mg/kg-day	--	--	--	7.34E-05	mg/kg-day	8.60E-01	mg/kg-day	9.E-05
			Exp. Route Total								--					2.E-04
		Exposure Point Total									--					2.E-04
	Exposure Medium Total										6.E-06					9.E+00
Soil Total											9.E-06					1.5.E+01
Groundwater	Air	Upward Migration of Vapors from Groundwater Trench Vapors (1)	Inhalation	Chloroform	3.33E-05	mg/m^3	4.65E-08	mg/kg-day	8.10E-02	$mg/kg\text{-}day^{-1}$	4.E-09	3.25E-06	mg/kg-day	1.40E-02	mg/kg-day	2.E-04
			Exp. Route Total								4.E-09					2.E-04
		Exposure Point Total									4.E-09					2.E-04
	Exposure Medium Total										4.E-09					2.E-04
Groundwater Total											4.E-09					2.E-04
											Total of Receptor Risks Across All Media					
											9.E-06	Total of Receptor Hazards Across All Media				1.5.E+01

TABLE E.1-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	24031	mg/kg	1.13E-02	mg/kg-day	--	--	--	3.29E-02	mg/kg-day	1.00E+00	mg/kg-day	3.E-02
				Antimony	1.13	mg/kg	5.31E-07	mg/kg-day	--	--	--	1.55E-06	mg/kg-day	4.00E-04	mg/kg-day	4.E-03
				Arsenic	20.57	mg/kg	9.66E-06	mg/kg-day	1.50E+00	mg/kg-day^{-1}	1.E-05	2.82E-05	mg/kg-day	3.00E-04	mg/kg-day	9.E-02
				Cadmium	1.191	mg/kg	5.59E-07	mg/kg-day	--	--	--	1.63E-06	mg/kg-day	1.00E-03	mg/kg-day	2.E-03
				Chromium	53.3	mg/kg	2.50E-05	mg/kg-day	--	--	--	7.30E-05	mg/kg-day	3.00E-03	mg/kg-day	2.E-02
				Cobalt	8.53	mg/kg	4.01E-06	mg/kg-day	--	--	--	1.17E-05	mg/kg-day	2.00E-02	mg/kg-day	6.E-04
				Copper	7568	mg/kg	3.55E-03	mg/kg-day	--	--	--	1.04E-02	mg/kg-day	4.00E-02	mg/kg-day	3.E-01
				Iron	37114	mg/kg	1.74E-02	mg/kg-day	--	--	--	5.08E-02	mg/kg-day	7.00E-01	mg/kg-day	7.E-02
				Manganese	407.6	mg/kg	1.91E-04	mg/kg-day	--	--	--	5.58E-04	mg/kg-day	2.00E-02	mg/kg-day	3.E-02
				Mercury	1.604	mg/kg	7.53E-07	mg/kg-day	--	--	--	2.20E-06	mg/kg-day	3.00E-04	mg/kg-day	7.E-03
				Thallium	0.406	mg/kg	1.91E-07	mg/kg-day	--	--	--	5.56E-07	mg/kg-day	7.00E-05	mg/kg-day	8.E-03
				Vanadium	48.31	mg/kg	2.27E-05	mg/kg-day	--	--	--	6.62E-05	mg/kg-day	1.00E-03	mg/kg-day	7.E-02
				Zinc	2342	mg/kg	1.10E-03	mg/kg-day	--	--	--	3.21E-03	mg/kg-day	3.00E-01	mg/kg-day	1.E-02
				Aroclor 1242	3.483	mg/kg	1.64E-06	mg/kg-day	2.00E+00	mg/kg-day^{-1}	3.E-06	4.77E-06	mg/kg-day	--	--	--
				Aroclor 1254	0.882	mg/kg	4.14E-07	mg/kg-day	2.00E+00	mg/kg-day^{-1}	8.E-07	1.21E-06	mg/kg-day	2.00E-05	mg/kg-day	6.E-02
				Aroclor 1260	0.0872	mg/kg	4.10E-08	mg/kg-day	2.00E+00	mg/kg-day^{-1}	8.E-08	1.19E-07	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	9.39E-10	mg/kg-day	--	--	--	2.74E-09	mg/kg-day	4.00E-02	mg/kg-day	7.E-08
				4-Methyl-2-Pentanone	0.00956	mg/kg	4.49E-09	mg/kg-day	--	--	--	1.31E-08	mg/kg-day	--	--	--
				Chloromethane	0.00117	mg/kg	5.50E-10	mg/kg-day	--	--	--	1.60E-09	mg/kg-day	--	--	--
				Cyclohexane	0.0408	mg/kg	1.92E-08	mg/kg-day	--	--	--	5.59E-08	mg/kg-day	--	--	--
				Methylcyclohexane	0.105	mg/kg	4.93E-08	mg/kg-day	--	--	--	1.44E-07	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.171	mg/kg	8.03E-08	mg/kg-day	--	--	--	2.34E-07	mg/kg-day	4.00E-02	mg/kg-day	6.E-06
				Benzo(a)anthracene*	0.643	mg/kg	3.02E-07	mg/kg-day	7.30E-01	mg/kg-day^{-1}	4.E-07	8.81E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0984	mg/kg	4.62E-08	mg/kg-day	7.30E+00	mg/kg-day^{-1}	6.E-07	1.35E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.118	mg/kg	5.54E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	7.E-08	1.62E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.0286	mg/kg	1.34E-08	mg/kg-day	7.30E+00	mg/kg-day^{-1}	2.E-07	3.92E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene*	0.0831	mg/kg	3.90E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	5.E-08	1.14E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	4.26E-12	mg/kg-day	1.50E+05	mg/kg-day^{-1}	6.E-07	1.24E-11	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	6.11E-05	mg/kg-day	1.70E-02	mg/kg-day^{-1}	1.E-06	1.78E-04	mg/kg-day	1.00E-04	mg/kg-day	2.E+00
			Exp. Route Total								2.E-05					2.E+00
			Dermal Absorption	Aluminum	24031	mg/kg	4.50E-04	mg/kg-day	--	--	--	1.31E-03	mg/kg-day	1.00E+00	mg/kg-day	1.E-03
				Antimony	1.13	mg/kg	2.12E-08	mg/kg-day	--	--	--	6.18E-08	mg/kg-day	6.00E-05	mg/kg-day	1.E-03
				Arsenic	20.57	mg/kg	1.16E-06	mg/kg-day	1.50E+00	mg/kg-day^{-1}	2.E-06	3.37E-06	mg/kg-day	3.00E-04	mg/kg-day	1.E-02
				Cadmium	1.191	mg/kg	2.23E-09	mg/kg-day	--	--	--	6.51E-09	mg/kg-day	2.50E-05	mg/kg-day	3.E-04
				Chromium	53.3	mg/kg	9.99E-07	mg/kg-day	--	--	--	2.91E-06	mg/kg-day	7.50E-05	mg/kg-day	4.E-02
				Cobalt	8.53	mg/kg	1.60E-07	mg/kg-day	--	--	--	4.66E-07	mg/kg-day	2.00E-02	mg/kg-day	2.E-05
				Copper	7568	mg/kg	1.42E-04	mg/kg-day	--	--	--	4.14E-04	mg/kg-day	4.00E-02	mg/kg-day	1.E-02
				Iron	37114	mg/kg	6.96E-04	mg/kg-day	--	--	--	2.03E-03	mg/kg-day	7.00E-01	mg/kg-day	3.E-03
				Manganese	407.6	mg/kg	7.64E-06	mg/kg-day	--	--	--	2.23E-05	mg/kg-day	8.00E-04	mg/kg-day	3.E-02
				Mercury	1.604	mg/kg	3.01E-08	mg/kg-day	--	--	--	8.77E-08	mg/kg-day	2.10E-04	mg/kg-day	4.E-04
				Thallium	0.406	mg/kg	7.61E-09	mg/kg-day	--	--	--	2.22E-08	mg/kg-day	7.00E-05	mg/kg-day	3.E-04
				Vanadium	48.31	mg/kg	9.05E-07	mg/kg-day	--	--	--	2.64E-06	mg/kg-day	2.60E-05	mg/kg-day	1.E-01
				Zinc	2342	mg/kg	4.39E-05	mg/kg-day	--	--	--	1.28E-04	mg/kg-day	3.00E-01	mg/kg-day	4.E-04
				Aroclor 1242	3.483	mg/kg	9.14E-07	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-06	2.67E-06	mg/kg-day	--	--	--

TABLE E.1-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Soil Cont.	Soil Cont.	Dermal Absorption Cont.	Aroclor 1254	0.882	mg/kg	2.31E-07	mg/kg-day	2.00E+00	mg/kg-day^{-1}	5.E-07	6.75E-07	mg/kg-day	2.00E-05	mg/kg-day	3.E-02
				Aroclor 1260	0.0872	mg/kg	2.29E-08	mg/kg-day	2.00E+00	mg/kg-day^{-1}	5.E-08	6.67E-08	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	1.12E-10	mg/kg-day	--	--	--	3.28E-10	mg/kg-day	4.00E-02	mg/kg-day	8.E-09
				4-Methyl-2-Pentanone	0.00956	mg/kg	5.37E-10	mg/kg-day	--	--	--	1.57E-09	mg/kg-day	--	--	--
				Chloromethane	0.00117	mg/kg	1.10E-12	mg/kg-day	--	--	--	3.20E-12	mg/kg-day	--	--	--
				Cyclohexane	0.0408	mg/kg	3.82E-11	mg/kg-day	--	--	--	1.12E-10	mg/kg-day	--	--	--
				Methylcyclohexane	0.105	mg/kg	5.90E-09	mg/kg-day	--	--	--	1.72E-08	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.171	mg/kg	3.20E-08	mg/kg-day	--	--	--	9.35E-08	mg/kg-day	4.00E-02	mg/kg-day	2.E-06
				Benzo(a)anthracene*	0.643	mg/kg	1.57E-07	mg/kg-day	7.30E-01	mg/kg-day^{-1}	2.E-07	4.57E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0984	mg/kg	2.40E-08	mg/kg-day	7.30E+00	mg/kg-day^{-1}	3.E-07	6.99E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.118	mg/kg	2.87E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	4.E-08	8.38E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.0286	mg/kg	6.97E-09	mg/kg-day	7.30E+00	mg/kg-day^{-1}	9.E-08	2.03E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene*	0.0831	mg/kg	2.02E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	3.E-08	5.90E-08	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	5.10E-13	mg/kg-day	1.50E+05	mg/kg-day^{-1}	8.E-08	1.49E-12	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	2.44E-06	mg/kg-day	1.70E-02	mg/kg-day^{-1}	4.E-08	7.11E-06	mg/kg-day	1.00E-04	mg/kg-day	7.E-02
			Exp. Route Total								5.E-06					3.E-01
		Exposure Point Total									3.E-05					3.E+00
	Exposure Medium Total										3.E-05					3.E+00
	Air	Fugitive Dust	Inhalation	Aluminum	24031	mg/kg	2.84E-07	mg/kg-day	--	--	--	8.27E-07	mg/kg-day	1.00E-03	mg/kg-day	8.E-04
				Antimony	1.13	mg/kg	1.33E-11	mg/kg-day	--	--	--	3.89E-11	mg/kg-day	--	--	--
				Arsenic	20.57	mg/kg	2.43E-10	mg/kg-day	1.50E+01	mg/kg-day^{-1}	4.E-09	7.08E-10	mg/kg-day	--	--	--
				Cadmium	1.191	mg/kg	1.41E-11	mg/kg-day	6.30E+00	mg/kg-day^{-1}	9.E-11	4.10E-11	mg/kg-day	5.70E-05	mg/kg-day	7.E-07
				Chromium	53.3	mg/kg	6.29E-10	mg/kg-day	4.10E+01	mg/kg-day^{-1}	3.E-08	1.83E-09	mg/kg-day	2.90E-05	mg/kg-day	6.E-05
				Cobalt	8.53	mg/kg	1.01E-10	mg/kg-day	9.80E+00	mg/kg-day^{-1}	1.E-09	2.94E-10	mg/kg-day	5.70E-06	mg/kg-day	5.E-05
				Copper	7568	mg/kg	8.93E-08	mg/kg-day	--	--	--	2.61E-07	mg/kg-day	--	--	--
				Iron	37114	mg/kg	4.38E-07	mg/kg-day	--	--	--	1.28E-06	mg/kg-day	--	--	--
				Manganese	407.6	mg/kg	4.81E-09	mg/kg-day	--	--	--	1.40E-08	mg/kg-day	1.43E-05	mg/kg-day	1.E-03
				Mercury	1.604	mg/kg	1.89E-11	mg/kg-day	--	--	--	5.52E-11	mg/kg-day	8.60E-05	mg/kg-day	6.E-07
				Thallium	0.406	mg/kg	4.79E-12	mg/kg-day	--	--	--	1.40E-11	mg/kg-day	--	--	--
				Vanadium	48.31	mg/kg	5.70E-10	mg/kg-day	--	--	--	1.66E-09	mg/kg-day	--	--	--
				Zinc	2342	mg/kg	2.76E-08	mg/kg-day	--	--	--	8.06E-08	mg/kg-day	--	--	--
				Aroclor 1242	3.483	mg/kg	4.11E-11	mg/kg-day	2.00E+00	mg/kg-day^{-1}	8.E-11	1.20E-10	mg/kg-day	--	--	--
				Aroclor 1254	0.882	mg/kg	1.04E-11	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-11	3.04E-11	mg/kg-day	--	--	--
				Aroclor 1260	0.0872	mg/kg	1.03E-12	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-12	3.00E-12	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	2.36E-14	mg/kg-day	--	--	--	6.89E-14	mg/kg-day	1.40E-03	mg/kg-day	5.E-11
				4-Methyl-2-Pentanone	0.00956	mg/kg	1.13E-13	mg/kg-day	--	--	--	3.29E-13	mg/kg-day	8.60E-01	mg/kg-day	4.E-13
				Chloromethane	0.00117	mg/kg	1.38E-14	mg/kg-day	--	--	--	4.03E-14	mg/kg-day	2.60E-02	mg/kg-day	2.E-12
				Cyclohexane	0.0408	mg/kg	4.82E-13	mg/kg-day	--	--	--	1.40E-12	mg/kg-day	1.70E+00	mg/kg-day	8.E-13
				Methylcyclohexane	0.105	mg/kg	1.24E-12	mg/kg-day	--	--	--	3.61E-12	mg/kg-day	8.60E-01	mg/kg-day	4.E-12
				Di-n-octylphthalate	0.171	mg/kg	2.02E-12	mg/kg-day	--	--	--	5.89E-12	mg/kg-day	--	--	--
				Benzo(a)anthracene*	0.643	mg/kg	7.59E-12	mg/kg-day	--	--	--	2.21E-11	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0984	mg/kg	1.16E-12	mg/kg-day	3.10E+00	mg/kg-day^{-1}	7.E-12	3.39E-12	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.118	mg/kg	1.39E-12	mg/kg-day	--	--	--	4.06E-12	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.0286	mg/kg	3.38E-13	mg/kg-day	--	--	--	9.85E-13	mg/kg-day	--	--	--

TABLE E.1-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air Cont.	Fugitive Dust Cont.	Inhalation Cont.	Indeno(1,2,3-cd)pyrene*	0.0831	mg/kg	9.81E-13	mg/kg-day	--	--	--	2.86E-12	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	1.07E-16	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-11	3.12E-16	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	1.53E-09	mg/kg-day	--	--	--	4.48E-09	mg/kg-day	--	--	--
			Exp. Route Total								3.E-08					2.E-03
		Exposure Point Total									3.E-08					2.E-03
		Outdoor Vapors	Inhalation	2-Hexanone	0.002	mg/kg	1.55E-09	mg/kg-day	--	--	--	4.51E-09	mg/kg-day	1.40E-03	mg/kg-day	3.E-06
				4-Methyl-2-Pentanone	0.00956	mg/kg	1.03E-08	mg/kg-day	--	--	--	2.99E-08	mg/kg-day	8.60E-01	mg/kg-day	3.E-08
				Chloromethane	0.00117	mg/kg	1.24E-08	mg/kg-day	--	--	--	3.62E-08	mg/kg-day	2.60E-02	mg/kg-day	1.E-06
				Cyclohexane	0.0408	mg/kg	2.75E-07	mg/kg-day	--	--	--	8.03E-07	mg/kg-day	1.70E+00	mg/kg-day	5.E-07
				Methylcyclohexane	0.105	mg/kg	7.83E-07	mg/kg-day	--	--	--	2.28E-06	mg/kg-day	8.60E-01	mg/kg-day	3.E-06
			Exp. Route Total								--					8.E-06
		Exposure Point Total									--					8.E-06
		Upward Migration of Vapors from Soil Indoor Air	Inhalation	2-Hexanone	1.11E-04	mg/m^3	7.10E-06	mg/kg-day	--	--	--	2.07E-05	mg/kg-day	1.40E-03	mg/kg-day	1.E-02
				4-Methyl-2-Pentanone	8.59E-04	mg/m^3	5.49E-05	mg/kg-day	--	--	--	1.60E-04	mg/kg-day	8.60E-01	mg/kg-day	2.E-04
				Chloromethane	8.63E-03	mg/m^3	5.52E-04	mg/kg-day	--	--	--	1.61E-03	mg/kg-day	2.60E-02	mg/kg-day	6.E-02
				Cyclohexane	3.69E-01	mg/m^3	2.36E-02	mg/kg-day	--	--	--	6.88E-02	mg/kg-day	1.70E+00	mg/kg-day	4.E-02
				Methylcyclohexane	1.60E+00	mg/m^3	1.02E-01	mg/kg-day	--	--	--	2.98E-01	mg/kg-day	8.60E-01	mg/kg-day	3.E-01
			Exp. Route Total								--					5.E-01
		Exposure Point Total									--					5.E-01
	Exposure Medium Total										3.E-08					5.E-01
Soil Total											3.E-05					3.2.E+00
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Chloroform	24	ug/L	2.25E-04	mg/kg-day	--	--	--	6.58E-04	mg/kg-day	1.00E-02	mg/kg-day	7.E-02
			Exp. Route Total								--					7.E-02
			Dermal Absorption	Chloroform	24	ug/L	2.55E-06	mg/kg-day	--	--	--	7.44E-06	mg/kg-day	1.00E-02	mg/kg-day	7.E-04
			Exp. Route Total								--					7.E-04
		Exposure Point Total									--					7.E-02
	Exposure Medium Total										--					7.E-02
	Air	Upward Migration of Vapors from Groundwater (Indoor) (1)	Inhalation	Chloroform	1.25E-04	mg/m^3	7.99E-06	mg/kg-day	8.10E-02	mg/kg-day $^{-1}$	6.E-07	2.33E-05	mg/kg-day	1.40E-02	mg/kg-day	2.E-03
			Exp. Route Total								6.E-07					2.E-03
		Exposure Point Total									6.E-07					2.E-03
		Vapors While Showering with Groundwater (2)	Inhalation	Chloroform	1.91E+00	mg/m^3	1.94E-03	mg/kg-day	8.10E-02	mg/kg-day $^{-1}$	2.E-04	4.53E-03	mg/kg-day	1.40E-02	mg/kg-day	3.E-01
			Exp. Route Total								2.E-04					3.E-01
		Exposure Point Total									2.E-04					3.E-01
	Exposure Medium Total										2.E-04					3.E-01
Groundwater Total											2.E-04					4.E-01
											Total of Receptor Risks Across All Media 2.E-04					Total of Receptor Hazards Across All Media 3.6.E+00

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).
(1) Receptor assessed using the Johnson and Ettinger Model (see Table E.1-4.7)
(2) Receptor assessed using shower model from Foster and Chrostowski (1989) (See Table E.1-4.8)

TABLE E.1-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	24031	mg/kg	2.63E-02	mg/kg-day	--	--	--	3.07E-01	mg/kg-day	1.00E+00	mg/kg-day	3.1.E-01
				Antimony	1.13	mg/kg	1.24E-06	mg/kg-day	--	--	--	1.44E-05	mg/kg-day	4.00E-04	mg/kg-day	4.E-02
				Arsenic	20.57	mg/kg	2.25E-05	mg/kg-day	1.50E+00	mg/kg-day^{-1}	3.E-05	2.63E-04	mg/kg-day	3.00E-04	mg/kg-day	9.E-01
				Cadmium	1.191	mg/kg	1.31E-06	mg/kg-day	--	--	--	1.52E-05	mg/kg-day	1.00E-03	mg/kg-day	2.E-02
				Chromium	53.3	mg/kg	5.84E-05	mg/kg-day	--	--	--	6.81E-04	mg/kg-day	3.00E-03	mg/kg-day	2.E-01
				Cobalt	8.53	mg/kg	9.35E-06	mg/kg-day	--	--	--	1.09E-04	mg/kg-day	2.00E-02	mg/kg-day	5.E-03
				Copper	7568	mg/kg	8.29E-03	mg/kg-day	--	--	--	9.68E-02	mg/kg-day	4.00E-02	mg/kg-day	2.E+00
				Iron	37114	mg/kg	4.07E-02	mg/kg-day	--	--	--	4.75E-01	mg/kg-day	7.00E-01	mg/kg-day	7.E-01
				Manganese	407.6	mg/kg	4.47E-04	mg/kg-day	--	--	--	5.21E-03	mg/kg-day	2.00E-02	mg/kg-day	3.E-01
				Mercury	1.604	mg/kg	1.76E-06	mg/kg-day	--	--	--	2.05E-05	mg/kg-day	3.00E-04	mg/kg-day	7.E-02
				Thallium	0.406	mg/kg	4.45E-07	mg/kg-day	--	--	--	5.19E-06	mg/kg-day	7.00E-05	mg/kg-day	7.E-02
				Vanadium	48.31	mg/kg	5.29E-05	mg/kg-day	--	--	--	6.18E-04	mg/kg-day	1.00E-03	mg/kg-day	6.E-01
				Zinc	2342	mg/kg	2.57E-03	mg/kg-day	--	--	--	2.99E-02	mg/kg-day	3.00E-01	mg/kg-day	1.E-01
				Aroclor 1242	3.483	mg/kg	3.82E-06	mg/kg-day	2.00E+00	mg/kg-day^{-1}	8.E-06	4.45E-05	mg/kg-day	--	--	--
				Aroclor 1254	0.882	mg/kg	9.67E-07	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-06	1.13E-05	mg/kg-day	2.00E-05	mg/kg-day	6.E-01
				Aroclor 1260	0.0872	mg/kg	9.56E-08	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-07	1.11E-06	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	2.19E-09	mg/kg-day	--	--	--	2.56E-08	mg/kg-day	4.00E-02	mg/kg-day	6.E-07
				4-Methyl-2-Pentanone	0.00956	mg/kg	1.05E-08	mg/kg-day	--	--	--	1.22E-07	mg/kg-day	--	--	--
				Chloromethane	0.00117	mg/kg	1.28E-09	mg/kg-day	--	--	--	1.50E-08	mg/kg-day	--	--	--
				Cyclohexane	0.0408	mg/kg	4.47E-08	mg/kg-day	--	--	--	5.22E-07	mg/kg-day	--	--	--
				Methylcyclohexane	0.105	mg/kg	1.15E-07	mg/kg-day	--	--	--	1.34E-06	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.171	mg/kg	1.87E-07	mg/kg-day	--	--	--	2.19E-06	mg/kg-day	4.00E-02	mg/kg-day	5.E-05
				Benzo(a)anthracene*	0.643	mg/kg	7.05E-07	mg/kg-day	7.30E-01	mg/kg-day^{-1}	3.E-06	8.22E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0984	mg/kg	1.08E-07	mg/kg-day	7.30E+00	mg/kg-day^{-1}	4.E-06	1.26E-06	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.118	mg/kg	1.29E-07	mg/kg-day	7.30E-01	mg/kg-day^{-1}	5.E-07	1.51E-06	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.0286	mg/kg	3.13E-08	mg/kg-day	7.30E+00	mg/kg-day^{-1}	1.E-06	3.66E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene*	0.0831	mg/kg	9.11E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	4.E-07	1.06E-06	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	9.94E-12	mg/kg-day	1.50E+05	mg/kg-day^{-1}	1.E-06	1.16E-10	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	1.42E-04	mg/kg-day	1.70E-02	mg/kg-day^{-1}	2.E-06	1.66E-03	mg/kg-day	1.00E-04	mg/kg-day	1.7.E+01
			Exp. Route Total								6.E-05					2.3.E+01
			Dermal Absorption	Aluminum	24031	mg/kg	7.37E-04	mg/kg-day	--	--	--	8.60E-03	mg/kg-day	1.00E+00	mg/kg-day	9.E-03
				Antimony	1.13	mg/kg	3.47E-08	mg/kg-day	--	--	--	4.05E-07	mg/kg-day	6.00E-05	mg/kg-day	7.E-03
				Arsenic	20.57	mg/kg	1.89E-06	mg/kg-day	1.50E+00	mg/kg-day^{-1}	3.E-06	2.21E-05	mg/kg-day	3.00E-04	mg/kg-day	7.E-02
				Cadmium	1.191	mg/kg	3.65E-09	mg/kg-day	--	--	--	4.26E-08	mg/kg-day	2.50E-05	mg/kg-day	2.E-03
				Chromium	53.3	mg/kg	1.64E-06	mg/kg-day	--	--	--	1.91E-05	mg/kg-day	7.50E-05	mg/kg-day	3.E-01
				Cobalt	8.53	mg/kg	2.62E-07	mg/kg-day	--	--	--	3.05E-06	mg/kg-day	2.00E-02	mg/kg-day	2.E-04
				Copper	7568	mg/kg	2.32E-04	mg/kg-day	--	--	--	2.71E-03	mg/kg-day	4.00E-02	mg/kg-day	7.E-02
				Iron	37114	mg/kg	1.14E-03	mg/kg-day	--	--	--	1.33E-02	mg/kg-day	7.00E-01	mg/kg-day	2.E-02
				Manganese	407.6	mg/kg	1.25E-05	mg/kg-day	--	--	--	1.46E-04	mg/kg-day	8.00E-04	mg/kg-day	2.E-01
				Mercury	1.604	mg/kg	4.92E-08	mg/kg-day	--	--	--	5.74E-07	mg/kg-day	2.10E-04	mg/kg-day	3.E-03
				Thallium	0.406	mg/kg	1.25E-08	mg/kg-day	--	--	--	1.45E-07	mg/kg-day	7.00E-05	mg/kg-day	2.E-03
				Vanadium	48.31	mg/kg	1.48E-06	mg/kg-day	--	--	--	1.73E-05	mg/kg-day	2.60E-05	mg/kg-day	7.E-01
				Zinc	2342	mg/kg	7.19E-05	mg/kg-day	--	--	--	8.38E-04	mg/kg-day	3.00E-01	mg/kg-day	3.E-03
				Aroclor 1242	3.483	mg/kg	1.50E-06	mg/kg-day	2.00E+00	mg/kg-day^{-1}	3.E-06	1.75E-05	mg/kg-day	--	--	--

TABLE E.1-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Soil Cont.	Soil Cont.		Aroclor 1254	0.882	mg/kg	3.79E-07	mg/kg-day	2.00E+00	mg/kg-day^{-1}	8.E-07	4.42E-06	mg/kg-day	2.00E-05	mg/kg-day	2.E-01
				Aroclor 1260	0.0872	mg/kg	3.75E-08	mg/kg-day	2.00E+00	mg/kg-day^{-1}	7.E-08	4.37E-07	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	1.84E-10	mg/kg-day	--	--	--	2.15E-09	mg/kg-day	4.00E-02	mg/kg-day	5.E-08
				4-Methyl-2-Pentanone	0.00956	mg/kg	8.80E-10	mg/kg-day	--	--	--	1.03E-08	mg/kg-day	--	--	--
				Chloromethane	0.00117	mg/kg	1.80E-12	mg/kg-day	--	--	--	2.09E-11	mg/kg-day	--	--	--
				Cyclohexane	0.0408	mg/kg	6.26E-11	mg/kg-day	--	--	--	7.30E-10	mg/kg-day	--	--	--
				Methylcyclohexane	0.105	mg/kg	9.67E-09	mg/kg-day	--	--	--	1.13E-07	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.171	mg/kg	5.25E-08	mg/kg-day	--	--	--	6.12E-07	mg/kg-day	4.00E-02	mg/kg-day	2.E-05
				Benzo(a)anthracene*	0.643	mg/kg	2.56E-07	mg/kg-day	7.30E-01	mg/kg-day^{-1}	1.E-06	2.99E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0984	mg/kg	3.93E-08	mg/kg-day	7.30E+00	mg/kg-day^{-1}	2.E-06	4.58E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.118	mg/kg	4.71E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	2.E-07	5.49E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.0286	mg/kg	1.14E-08	mg/kg-day	7.30E+00	mg/kg-day^{-1}	4.E-07	1.33E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene*	0.0831	mg/kg	3.31E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	1.E-07	3.87E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	8.35E-13	mg/kg-day	1.50E+05	mg/kg-day^{-1}	1.E-07	9.74E-12	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	3.99E-06	mg/kg-day	1.70E-02	mg/kg-day^{-1}	7.E-08	4.65E-05	mg/kg-day	1.00E-04	mg/kg-day	5.E-01
			Exp. Route Total								1.E-05					2.E+00
		Exposure Point Total									7.E-05					2.5.E+01
	Exposure Medium Total										7.E-05					2.5.E+01
	Air	Fugitive Dust	Inhalation	Aluminum	24031	mg/kg	5.98E-07	mg/kg-day	--	--	--	6.98E-06	mg/kg-day	1.00E-03	mg/kg-day	7.E-03
				Antimony	1.13	mg/kg	2.81E-11	mg/kg-day	--	--	--	3.28E-10	mg/kg-day	--	--	--
				Arsenic	20.57	mg/kg	5.12E-10	mg/kg-day	1.50E+01	mg/kg-day^{-1}	8.E-09	5.97E-09	mg/kg-day	--	--	--
				Cadmium	1.191	mg/kg	2.96E-11	mg/kg-day	6.30E+00	mg/kg-day^{-1}	2.E-10	3.46E-10	mg/kg-day	5.70E-05	mg/kg-day	6.E-06
				Chromium	53.3	mg/kg	1.33E-09	mg/kg-day	4.10E+01	mg/kg-day^{-1}	5.E-08	1.55E-08	mg/kg-day	2.90E-05	mg/kg-day	5.E-04
				Cobalt	8.53	mg/kg	2.12E-10	mg/kg-day	9.80E+00	mg/kg-day^{-1}	2.E-09	2.48E-09	mg/kg-day	5.70E-06	mg/kg-day	4.E-04
				Copper	7568	mg/kg	1.88E-07	mg/kg-day	--	--	--	2.20E-06	mg/kg-day	--	--	--
				Iron	37114	mg/kg	9.24E-07	mg/kg-day	--	--	--	1.08E-05	mg/kg-day	--	--	--
				Manganese	407.6	mg/kg	1.01E-08	mg/kg-day	--	--	--	1.18E-07	mg/kg-day	1.43E-05	mg/kg-day	8.E-03
				Mercury	1.604	mg/kg	3.99E-11	mg/kg-day	--	--	--	4.66E-10	mg/kg-day	8.60E-05	mg/kg-day	5.E-06
				Thallium	0.406	mg/kg	1.01E-11	mg/kg-day	--	--	--	1.18E-10	mg/kg-day	--	--	--
				Vanadium	48.31	mg/kg	1.20E-09	mg/kg-day	--	--	--	1.40E-08	mg/kg-day	--	--	--
				Zinc	2342	mg/kg	5.83E-08	mg/kg-day	--	--	--	6.80E-07	mg/kg-day	--	--	--
				Aroclor 1242	3.483	mg/kg	8.67E-11	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-10	1.01E-09	mg/kg-day	--	--	--
				Aroclor 1254	0.882	mg/kg	2.19E-11	mg/kg-day	2.00E+00	mg/kg-day^{-1}	4.E-11	2.56E-10	mg/kg-day	--	--	--
				Aroclor 1260	0.0872	mg/kg	2.17E-12	mg/kg-day	2.00E+00	mg/kg-day^{-1}	4.E-12	2.53E-11	mg/kg-day	--	--	--
				2-Hexanone	0.002	mg/kg	4.98E-14	mg/kg-day	--	--	--	5.81E-13	mg/kg-day	1.40E-03	mg/kg-day	4.E-10
				4-Methyl-2-Pentanone	0.00956	mg/kg	2.38E-13	mg/kg-day	--	--	--	2.78E-12	mg/kg-day	8.60E-01	mg/kg-day	3.E-12
				Chloromethane	0.00117	mg/kg	2.91E-14	mg/kg-day	--	--	--	3.40E-13	mg/kg-day	2.60E-02	mg/kg-day	1.E-11
				Cyclohexane	0.0408	mg/kg	1.02E-12	mg/kg-day	--	--	--	1.18E-11	mg/kg-day	1.70E+00	mg/kg-day	7.E-12
				Methylcyclohexane	0.105	mg/kg	2.61E-12	mg/kg-day	--	--	--	3.05E-11	mg/kg-day	8.60E-01	mg/kg-day	4.E-11
				Di-n-octylphthalate	0.171	mg/kg	4.26E-12	mg/kg-day	--	--	--	4.96E-11	mg/kg-day	--	--	--
				Benzo(a)anthracene*	0.643	mg/kg	1.60E-11	mg/kg-day	--	--	--	1.87E-10	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0984	mg/kg	2.45E-12	mg/kg-day	3.10E+00	mg/kg-day^{-1}	4.E-11	2.86E-11	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.118	mg/kg	2.94E-12	mg/kg-day	--	--	--	3.43E-11	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.0286	mg/kg	7.12E-13	mg/kg-day	--	--	--	8.30E-12	mg/kg-day	--	--	--

TABLE E.1-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air Cont.	Fugitive Dust Cont.	Inhalation Cont.	Indeno(1,2,3-cd)pyrene*	0.0831	mg/kg	2.07E-12	mg/kg-day	--	--	--	2.41E-11	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	9.07E-06	mg/kg	2.26E-16	mg/kg-day	1.50E+05	mg/kg-day^{-1}	3.E-11	2.63E-15	mg/kg-day	--	--	--
				Nitroglycerin	130	mg/kg	3.24E-09	mg/kg-day	--	--	--	3.77E-08	mg/kg-day	--	--	--
			Exp. Route Total								6.E-08					2.E-02
		Exposure Point Total									6.E-08					2.E-02
		Outdoor Vapors	Inhalation	2-Hexanone	0.002	mg/kg	6.52E-09	mg/kg-day	--	--	--	7.61E-08	mg/kg-day	1.40E-03	mg/kg-day	5.E-05
				4-Methyl-2-Pentanone	0.00956	mg/kg	4.32E-08	mg/kg-day	--	--	--	5.05E-07	mg/kg-day	8.60E-01	mg/kg-day	6.E-07
				Chloromethane	0.00117	mg/kg	5.24E-08	mg/kg-day	--	--	--	6.11E-07	mg/kg-day	2.60E-02	mg/kg-day	2.E-05
				Cyclohexane	0.0408	mg/kg	1.16E-06	mg/kg-day	--	--	--	1.35E-05	mg/kg-day	1.70E+00	mg/kg-day	8.E-06
				Methylcyclohexane	0.105	mg/kg	3.30E-06	mg/kg-day	--	--	--	3.85E-05	mg/kg-day	8.60E-01	mg/kg-day	4.E-05
			Exp. Route Total								--					1.E-04
		Exposure Point Total									--					1.E-04
		Upward Migration of Vapors from Soil Indoor Air	Inhalation	2-Hexanone	1.11E-04	mg/m^3	5.47E-06	mg/kg-day	--	--	--	6.39E-05	mg/kg-day	1.40E-03	mg/kg-day	4.6.E-02
				4-Methyl-2-Pentanone	8.59E-04	mg/m^3	4.24E-05	mg/kg-day	--	--	--	4.94E-04	mg/kg-day	8.60E-01	mg/kg-day	6.E-04
				Chloromethane	8.63E-03	mg/m^3	4.26E-04	mg/kg-day	--	--	--	4.97E-03	mg/kg-day	2.60E-02	mg/kg-day	2.E-01
				Cyclohexane	3.69E-01	mg/m^3	1.82E-02	mg/kg-day	--	--	--	2.12E-01	mg/kg-day	1.70E+00	mg/kg-day	1.E-01
				Methylcyclohexane	1.60E+00	mg/m^3	7.89E-02	mg/kg-day	--	--	--	9.21E-01	mg/kg-day	8.60E-01	mg/kg-day	1.E+00
			Exp. Route Total								--					1.4.E+00
		Exposure Point Total									--					1.4.E+00
	Exposure Medium Total										6.E-08					1.4.E+00
Soil Total											7.E-05					2.6.E+01
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Chloroform	24	ug/L	1.32E-04	mg/kg-day	--	--	--	1.53E-03	mg/kg-day	1.00E-02	mg/kg-day	2.E-01
			Exp. Route Total								--					2.E-01
			Dermal Absorption	Chloroform	24	ug/L	1.65E-06	mg/kg-day	--	--	--	1.93E-05	mg/kg-day	1.00E-02	mg/kg-day	2.E-03
			Exp. Route Total								--					2.E-03
		Exposure Point Total									--					2.E-01
	Exposure Medium Total										--					2.E-01
	Air	Upward Migration of Vapors from Groundwater (Indoor) (1)	Inhalation	Chloroform	1.25E-04	mg/m^3	6.16E-06	mg/kg-day	8.10E-02	mg/kg-day^{-1}	5.E-07	7.19E-05	mg/kg-day	1.40E-02	mg/kg-day	5.E-03
			Exp. Route Total								5.E-07					5.E-03
		Exposure Point Total									5.E-07					5.E-03
	Exposure Medium Total										5.E-07					5.E-03
Groundwater Total											5.E-07					2.E-01
											Total of Receptor Risks Across All Media					
											7.E-05	Total of Receptor Hazards Across All Media				2.6.E+01

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).
(1) Receptor assessed using the Johnson and Ettinger Model (see Table 4.7)

TABLE E.1-7.7.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Total Soil	Soil	Soil	Ingestion	Aluminum	24031	mg/kg	--
				Antimony	1.13	mg/kg	--
				Arsenic	20.57	mg/kg	5.E-05
				Cadmium	1.191	mg/kg	--
				Chromium	53.3	mg/kg	--
				Cobalt	8.53	mg/kg	--
				Copper	7568	mg/kg	--
				Iron	37114	mg/kg	--
				Manganese	407.6	mg/kg	--
				Mercury	1.604	mg/kg	--
				Thallium	0.406	mg/kg	--
				Vanadium	48.31	mg/kg	--
				Zinc	2342	mg/kg	--
				Aroclor 1242	3.483	mg/kg	1.E-05
				Aroclor 1254	0.882	mg/kg	3.E-06
				Aroclor 1260	0.0872	mg/kg	3.E-07
				2-Hexanone	0.002	mg/kg	--
				4-Methyl-2-Pentanone	0.00956	mg/kg	--
				Chloromethane	0.00117	mg/kg	--
				Cyclohexane	0.0408	mg/kg	--
				Methylcyclohexane	0.105	mg/kg	--
				Di-n-octylphthalate	0.171	mg/kg	--
				Benzo(a)anthracene*	0.643	mg/kg	3.E-06
				Benzo(a)pyrene*	0.0984	mg/kg	5.E-06
				Benzo(b)fluoranthene*	0.118	mg/kg	6.E-07
				Dibenz(a,h)anthrancene*	0.0286	mg/kg	1.E-06
				Indeno(1,2,3-cd)pyrene*	0.0831	mg/kg	4.E-07
				2,3,7,8-TCDD TEQ	9.068E-06	mg/kg	2.E-06
				Nitroglycerin	130	mg/kg	3.E-06
			Exp. Route Total				8.E-05
			Dermal Absorption	Aluminum	24031	mg/kg	--
				Antimony	1.13	mg/kg	--
				Arsenic	20.57	mg/kg	--
				Cadmium	1.191	mg/kg	--
				Chromium	53.3	mg/kg	--
				Cobalt	8.53	mg/kg	--
				Copper	7568	mg/kg	--
				Iron	37114	mg/kg	--
				Manganese	407.6	mg/kg	--
				Mercury	1.604	mg/kg	--
				Thallium	0.406	mg/kg	--
				Vanadium	48.31	mg/kg	--
				Zinc	2342	mg/kg	--
				Aroclor 1242	3.483	mg/kg	2.E-06
				Aroclor 1254	0.882	mg/kg	1.E-05
				Aroclor 1260	0.0872	mg/kg	7.E-05
				2-Hexanone	0.002	mg/kg	--
				4-Methyl-2-Pentanone	0.00956	mg/kg	--
				Chloromethane	0.00117	mg/kg	--
				Cyclohexane	0.0408	mg/kg	--
				Methylcyclohexane	0.105	mg/kg	--
				Di-n-octylphthalate	0.171	mg/kg	--
				Benzo(a)anthracene*	0.643	mg/kg	2.E-07
				Benzo(a)pyrene*	0.0984	mg/kg	--
				Benzo(b)fluoranthene*	0.118	mg/kg	--
				Dibenz(a,h)anthrancene*	0.0286	mg/kg	--
				Indeno(1,2,3-cd)pyrene*	0.0831	mg/kg	--
				2,3,7,8-TCDD TEQ	9.068E-06	mg/kg	--
				Nitroglycerin	130	mg/kg	--
			Exp. Route Total				8.E-05
		Exposure Point Total					2.E-04
	Exposure Medium Total						2.E-04

TABLE E.1-7.7.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Populatior:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	24031	mg/kg	--
				Antimony	1.13	mg/kg	--
				Arsenic	20.57	mg/kg	1.E-08
				Cadmium	1.191	mg/kg	9.E-11
				Chromium	53.3	mg/kg	--
				Cobalt	8.53	mg/kg	--
				Copper	7568	mg/kg	--
				Iron	37114	mg/kg	--
				Manganese	407.6	mg/kg	--
				Mercury	1.604	mg/kg	--
				Thallium	0.406	mg/kg	--
				Vanadium	48.31	mg/kg	--
				Zinc	2342	mg/kg	--
				Aroclor 1242	3.483	mg/kg	--
				Aroclor 1254	0.882	mg/kg	--
				Aroclor 1260	0.0872	mg/kg	4.E-11
				2-Hexanone	0.002	mg/kg	--
				4-Methyl-2-Pentanone	0.00956	mg/kg	--
				Chloromethane	0.00117	mg/kg	--
				Cyclohexane	0.0408	mg/kg	--
				Methylcyclohexane	0.105	mg/kg	--
				Di-n-octylphthalate	0.171	mg/kg	--
				Benzo(a)anthracene*	0.643	mg/kg	--
				Benzo(a)pyrene*	0.0984	mg/kg	--
				Benzo(b)fluoranthene*	0.118	mg/kg	--
				Dibenz(a,h)anthrancene*	0.0286	mg/kg	--
				Indeno(1,2,3-cd)pyrene*	0.0831	mg/kg	--
				2,3,7,8-TCDD TEQ	9.068E-06	mg/kg	--
				Nitroglycerin	130	mg/kg	--
			Exp. Route Total				1.E-08
		Exposure Point Total					1.E-08
		Outdoor Vapors	Inhalation	2-Hexanone	0.002	mg/kg	--
				4-Methyl-2-Pentanone	0.00956	mg/kg	--
				Chloromethane	0.00117	mg/kg	--
				Cyclohexane	0.0408	mg/kg	--
				Methylcyclohexane	0.105	mg/kg	--
			Exp. Route Total				--
		Exposure Point Total					--
		Upward Migration of Vapors from Soil Indoor Air	Inhalation	2-Hexanone	0.000111	mg/m^3	--
				4-Methyl-2-Pentanone	0.000859	mg/m^4	--
				Chloromethane	0.00863	mg/m^5	--
				Cyclohexane	0.369	mg/m^6	--
				Methylcyclohexane	1.6	mg/m^7	--
			Exp. Route Total				--
		Exposure Point Total					--
	Exposure Medium Total						1.E-08
Soil Total							2.E-04
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Chloroform	24	ug/L	--
			Exp. Route Total				--
			Dermal Absorption	Chloroform	24	ug/L	--
			Exp. Route Total				--
		Exposure Point Total					--
	Exposure Medium Total						--

TABLE E.1-7.7.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Groundwater Cont.	Air	Upward Migration of Vapors from Groundwater (Indoor) (1)	Inhalation	Chloroform	0.000125	mg/m^3	1.E-06
			Exp. Route Total				1.E-06
		Exposure Point Total					1.E-06
		Vapors While Showering with Groundwater (2)	Inhalation	Chloroform	1.91	mg/m^3	2.E-04
			Exp. Route Total				2.E-04
		Exposure Point Total					2.E-04
	Exposure Medium Total						2.E-04
Groundwater Total							2.E-04
							3.E-04

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).

(1) Receptor assessed using the Johnson and Ettinger Model (see Table 4.7)

(2) Receptor assessed using shower model from Foster and Chrostowski (1989) (See Table 4.8)

TABLE E.1-9.1.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Maintenance Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	3.3.E-03	--	1.E-04	3.E-03
			Arsenic	2.7.E-06	--	3.E-07	3.E-06	Arsenic	skin/ vascular	2.E-02	--	2.E-03	2.E-02
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	2.E-03	--	2.E-03	4.E-03
			Cobalt	--	--	--	--	Cobalt	blood	8.E-05	--	3.E-06	8.E-05
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	8.E-03	--	3.E-04	9.E-03
			Manganese	--	--	--	--	Manganese	CNS	4.E-03	--	3.E-03	7.E-03
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	2.E-03	--	6.E-05	2.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	1.E-02	--	1.E-02	2.E-02
			Aroclor 1254	7.3.E-08	--	3.E-08	1.E-07	Aroclor 1254	eyes	5.E-03	--	2.E-03	7.E-03
			Aroclor 1260	7.6.E-09	--	4.E-09	1.E-08	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	1.E-08	--	1.E-09	1.E-08
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Chloromethane	--	--	--	--	Chloromethane	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	9.E-07	--	3.E-07	1.E-06
			Benzo(a)anthracene	5.1.E-09	--	2.E-09	7.E-09	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	6.1.E-08	--	3.E-08	9.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	1.3.E-08	--	6.E-09	2.E-08	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	1.9.E-08	--	8.E-09	3.E-08	Dibenz(a,h)anthrancene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	4.8.E-09	--	2.E-09	7.E-09	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	7.3.E-08	--	7.E-09	8.E-08	2,3,7,8-TCDD TEQ	NA	--	--	--	--
				3.E-06	--	4.E-07	3.E-06			5.2.E-02	--	2.4.E-02	8.E-02
		Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	6.E-04	--	6.E-04
			Arsenic	--	5.E-09	--	5.E-09	Arsenic	NA	--	--	--	--
			Chromium	--	1.E-08	--	1.E-08	Chromium	respiratory	--	3.E-05	--	3.E-05
			Cobalt	--	1.E-09	--	1.E-09	Cobalt	respiratory	--	5.E-05	--	5.E-05
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	1.E-03	--	1.E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Aroclor 1254	--	1.E-11	--	1.E-11	Aroclor 1254	NA	--	--	--	--
			Aroclor 1260	--	1.E-12	--	1.E-12	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	5.E-11	--	5.E-11
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	5.E-13	--	5.E-13
			Chloromethane	--	--	--	--	Chloromethane	brain	--	2.E-12	--	2.E-12
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	6.E-14	--	6.E-14
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	2.E-13	--	2.E-13
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	--	5.E-12	--	5.E-12	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	--	--	--	--	Dibenz(a,h)anthrancene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	1.E-11	--	1.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
				--	2.E-08	--	2.E-08			--	2.E-03	--	2.E-03

TABLE E.1-9.1.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Maintenance Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil Cont.	Soil Cont.	Air (Outdoor Vapors)	2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	3.E-06	--	3.E-06
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	5.E-08	--	5.E-08
			Chloromethane	--	--	--	--	Chloromethane	brain	--	2.E-06	--	2.E-06
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	4.E-08	--	4.E-08
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	2.E-07	--	2.E-07
				--	--	--	--			--	5.E-06	--	5.E-06
							Total Risk Across Soil						Total Hazard Index Across Soil
							3.E-06						8.E-02

Total Risk Across All Media and All Exposure Routes	3.E-06
Total Hazard Index Across All Media and All Exposure Routes	8.E-02

Total blood HI across all media =	1.E-02
Total CNS HI across all media =	1.E-02
Total skin HI across all media =	2.E-02
Total respiratory HI across all media =	8.E-05
Total GI tract HI across all media =	1.E-02
Total kidney HI across all media =	2.E-02
Total liver HI across all media =	1.E-02
Total vascular HI across all media =	2.E-02
Total eyes HI across all media =	7.E-03
Total hair HI across all media =	2.E-03
Total brain HI across all media =	2.E-06
Total fetus HI across all media =	4.E-03

TABLE E.1-9.2.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Maintenance Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	4.7.E-03	--	2.E-04	5.E-03
			Antimony	--	--	--	--	Antimony	blood	6.E-04	--	1.E-04	7.E-04
			Arsenic	2.2.E-06	--	2.E-07	2.E-06	Arsenic	skin/ vascular	1.E-02	--	1.E-03	1.E-02
			Cadmium	--	--	--	--	Cadmium	kidney	2.E-04	--	3.E-05	3.E-04
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	3.E-03	--	5.E-03	8.E-03
			Cobalt	--	--	--	--	Cobalt	blood	8.E-05	--	3.E-06	9.E-05
			Copper	--	--	--	--	Copper	GI tract	4.E-02	--	1.E-03	4.E-02
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	1.E-02	--	3.E-04	1.E-02
			Manganese	--	--	--	--	Manganese	CNS	4.E-03	--	3.E-03	7.E-03
			Mercury	--	--	--	--	Mercury	immune system	1.E-03	--	5.E-05	1.E-03
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	1.E-03	--	4.E-05	1.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	9.E-03	--	1.E-02	2.E-02
			Zinc	--	--	--	--	Zinc	blood	2.E-03	--	5.E-05	2.E-03
			Aroclor 1242	4.9.E-07	--	2.E-07	7.E-07	Aroclor 1242	NA	--	--	--	--
			Aroclor 1254	1.2.E-07	--	6.E-08	2.E-07	Aroclor 1254	eyes	9.E-03	--	4.E-03	1.E-02
			Aroclor 1260	1.2.E-08	--	6.E-09	2.E-08	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	1.E-08	--	1.E-09	1.E-08
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Chloromethane	--	--	--	--	Chloromethane	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	8.E-07	--	3.E-07	1.E-06
			Benzo(a)anthracene	3.3.E-08	--	1.E-08	5.E-08	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	5.0.E-08	--	2.E-08	7.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	6.0.E-09	--	3.E-09	9.E-09	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	1.5.E-08	--	6.E-09	2.E-08	Dibenz(a,h)anthrancene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	4.2.E-09	--	2.E-09	6.E-09	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	9.5.E-08	--	9.E-09	1.E-07	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Nitroglycerin	1.5.E-07	--	5.E-09	2.E-07	Nitroglycerin	vascular	3.E-01	--	8.E-03	3.E-01
				3.E-06	--	6.E-07	4.E-06			3.5.E-01	--	3.6.E-02	4.E-01
		Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	9.E-04	--	9.E-04
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	4.E-09	--	4.E-09	Arsenic	NA	--	--	--	--
			Cadmium	--	1.E-10	--	1.E-10	Cadmium	respiratory	--	7.E-07	--	7.E-07
			Chromium	--	3.E-08	--	3.E-08	Chromium	respiratory	--	7.E-05	--	7.E-05
			Cobalt	--	1.E-09	--	1.E-09	Cobalt	respiratory	--	5.E-05	--	5.E-05
			Copper	--	--	--	--	Copper	NA	--	--	--	--
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	1.E-03	--	1.E-03
			Mercury	--	--	--	--	Mercury	CNS	--	7.E-07	--	7.E-07
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Zinc	--	--	--	--	Zinc	NA	--	--	--	--
			Aroclor 1242	--	9.E-11	--	9.E-11	Aroclor 1242	NA	--	--	--	--
			Aroclor 1254	--	2.E-11	--	2.E-11	Aroclor 1254	NA	--	--	--	--
			Aroclor 1260	--	2.E-12	--	2.E-12	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	5.E-11	--	5.E-11
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	4.E-13	--	4.E-13
			Chloromethane	--	--	--	--	Chloromethane	brain	--	2.E-12	--	2.E-12
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	9.E-13	--	9.E-13
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	4.E-12	--	4.E-12
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	--	4.E-12	--	4.E-12	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	--	--	--	--	Dibenz(a,h)anthrancene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	2.E-11	--	2.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
				--	3.E-08	--	3.E-08			--	2.E-03	--	2.E-03

TABLE E.1-9.2.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Maintenance Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil Cont.	Soil Cont.	Air (Outdoor Vapors)	2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	3.E-06	--	3.E-06
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	4.E-08	--	4.E-08
			Chloromethane	--	--	--	--	Chloromethane	brain	--	1.E-06	--	1.E-06
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	5.E-07	--	5.E-07
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	3.E-06	--	3.E-06
				--	--	--	--			--	8.E-06	--	8.E-06
							Total Risk Across Soil: 4.E-06						Total Hazard Index Across Soil: 4.E-01

Total Risk Across All Media and All Exposure Routes: 4.E-06

Total Hazard Index Across All Media and All Exposure Routes: 4.E-01

Total blood HI across all media =	1.E-02
Total CNS HI across all media =	1.E-02
Total skin HI across all media =	1.E-02
Total respiratory HI across all media =	1.E-04
Total GI tract HI across all media =	6.E-02
Total kidney HI across all media =	2.E-02
Total liver HI across all media =	2.E-02
Total vascular HI across all media =	3.E-01
Total eyes HI across all media =	1.E-02
Total hair HI across all media =	1.E-03
Total brain HI across all media =	1.E-06
Total fetus HI across all media =	8.E-03

TABLE E.1-9.3.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Commercial Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	1.E-02	--	8.E-04	1.E-02
			Antimony	--	--	--	--	Antimony	blood	1.E-03	--	6.E-04	2.E-03
			Arsenic	5.E-06	--	1.E-06	6.E-06	Arsenic	skin/ vascular	3.E-02	--	7.E-03	4.E-02
			Cadmium	--	--	--	--	Cadmium	kidney	6.E-04	--	2.E-04	7.E-04
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	9.E-03	--	2.E-02	3.E-02
			Cobalt	--	--	--	--	Cobalt	blood	2.E-04	--	1.E-05	2.E-04
			Copper	--	--	--	--	Copper	GI tract	9.E-02	--	6.E-03	1.E-01
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	3.E-02	--	2.E-03	3.E-02
			Manganese	--	--	--	--	Manganese	CNS	1.E-02	--	2.E-02	3.E-02
			Mercury	--	--	--	--	Mercury	immune system	3.E-03	--	2.E-04	3.E-03
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	3.E-03	--	2.E-04	3.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	2.E-02	--	6.E-02	8.E-02
			Zinc	--	--	--	--	Zinc	blood	4.E-03	--	3.E-04	4.E-03
			Aroclor 1242	1.E-06	--	1.E-06	2.E-06	Aroclor 1242	NA	--	--	--	--
			Aroclor 1254	3.E-07	--	3.E-07	6.E-07	Aroclor 1254	eyes	2.E-02	--	2.E-02	4.E-02
			Aroclor 1260	3.E-08	--	3.E-08	6.E-08	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	2.E-08	--	5.E-09	3.E-08
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Chloromethane	--	--	--	--	Chloromethane	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	2.E-06	--	1.E-06	3.E-06
			Benzo(a)anthracene	8.E-08	--	7.E-08	2.E-07	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.E-07	--	1.E-07	2.E-07	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	2.E-08	--	1.E-08	3.E-08	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	4.E-08	--	3.E-08	7.E-08	Dibenz(a,h)anthrancene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	1.E-08	--	9.E-09	2.E-08	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	2.E-07	--	5.E-08	3.E-07	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Nitroglycerin	4.E-07	--	3.E-08	4.E-07	Nitroglycerin	vascular	6.E-01	--	4.E-02	7.E-01
			Total	8.E-06	--	3.E-06	1.E-05	Total		9.E-01	--	2.E-01	1.E+00
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	3.E-03	--	3.E-03
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	1.E-08	--	1.E-08	Arsenic	NA	--	--	--	--
			Cadmium	--	3.E-10	--	3.E-10	Cadmium	respiratory	--	2.E-06	--	2.E-06
			Chromium	--	9.E-08	--	9.E-08	Chromium	respiratory	--	2.E-04	--	2.E-04
			Cobalt	--	4.E-09	--	4.E-09	Cobalt	respiratory	--	2.E-04	--	2.E-04
			Copper	--	--	--	--	Copper	NA	--	--	--	--
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	3.E-03	--	3.E-03
			Mercury	--	--	--	--	Mercury	CNS	--	2.E-06	--	2.E-06
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Zinc	--	--	--	--	Zinc	NA	--	--	--	--
			Aroclor 1242	--	3.E-10	--	3.E-10	Aroclor 1242	NA	--	--	--	--
			Aroclor 1254	--	7.E-11	--	7.E-11	Aroclor 1254	NA	--	--	--	--
			Aroclor 1260	--	7.E-12	--	7.E-12	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	2.E-10	--	2.E-10
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	1.E-12	--	1.E-12
			Chloromethane	--	--	--	--	Chloromethane	brain	--	5.E-12	--	5.E-12
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	3.E-12	--	3.E-12
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	1.E-11	--	1.E-11
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	--	1.E-11	--	1.E-11	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	--	--	--	--	Dibenz(a,h)anthrancene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	6.E-11	--	6.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			Total	--	1.E-07	--	1.E-07	Total		--	7.E-03	--	7.E-03

TABLE E.1-9.3.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Commercial Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil Cont.	Air Cont.	Air (Outdoor Vapors)	2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	1.E-05	--	1.E-05
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	1.E-07	--	1.E-07
			Chloromethane	--	--	--	--	Chloromethane	brain	--	5.E-06	--	5.E-06
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	2.E-06	--	2.E-06
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	9.E-06	--	9.E-06
				--	--	--	--			--	3.E-05	--	3.E-05
		Air (Indoor Vapors)	2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	6.E-03	--	6.E-03
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	8.E-05	--	8.E-05
			Chloromethane	--	--	--	--	Chloromethane	brain	--	3.E-02	--	3.E-02
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	2.E-02	--	2.E-02
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	1.E-01	--	1.E-01
				--	--	--	--			--	2.E-01	--	2.E-01
Groundwater	Groundwater	Groundwater used as tapwater	Chloroform	--	--	--	--	Chloroform	liver	2.E-02	--	4.E-05	2.E-02
			Total	--	--	--	--	Total		2.E-02	--	4.E-05	2.E-02
	Air	Air (Indoor Air)	Chloroform	--	3.E-07	--	3.E-07	Chloroform	liver	--	7.E-04	--	7.E-04
				--	3.E-07	--	3.E-07			--	7.E-04	--	7.E-04
						Total Risk Across Soil	1.E-05					Total Hazard Index Across Soil	1.E+00
						Total Risk Across Groundwater	3.E-07					Total Hazard Index Across Groundwater	2.E-02
						Total Risk Across All Media and All Exposure Routes	1.E-05					Total Hazard Index Across All Media and All Exposure Routes	1.E+00

Total blood HI across all media =	4.E-02
Total CNS HI across all media =	5.E-02
Total skin HI across all media =	4.E-02
Total respiratory HI across all media =	4.E-04
Total GI tract HI across all media =	2.E-01
Total kidney HI across all media =	2.E-01
Total liver HI across all media =	9.E-02
Total vascular HI across all media =	7.E-01
Total eyes HI across all media =	4.E-02
Total immune system HI across all media =	3.E-03
Total thyroid HI across all media =	3.E-06
Total hair HI across all media =	3.E-03
Total brain HI across all media =	3.E-02
Total fetus HI across all media =	5.E-02

TABLE E.1-9.4.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Construction Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	8.E-02	--	2.E-03	8.E-02
			Antimony	--	--	--	--	Antimony	blood	2.E-02	--	4.E-03	2.E-02
			Arsenic	1.E-06	--	1.E-07	2.E-06	Arsenic	skin/ vascular	2.E-01	--	2.E-02	2.E-01
			Cadmium	--	--	--	--	Cadmium	kidney	4.E-03	--	5.E-04	4.E-03
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	9.E-03	--	1.E-02	2.E-02
			Cobalt	--	--	--	--	Cobalt	blood	1.E-03	--	4.E-05	1.E-03
			Copper	--	--	--	--	Copper	GI tract	6.E-01	--	2.E-02	6.E-01
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	4.E-01	--	1.E-02	4.E-01
			Manganese	--	--	--	--	Manganese	CNS	7.E-02	--	5.E-02	1.E-01
			Mercury	--	--	--	--	Mercury	immune system	2.E-02	--	--	2.E-02
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	2.E-02	--	6.E-04	2.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	2.E-02	--	3.E-02	5.E-02
			Zinc	--	--	--	--	Zinc	blood	3.E-02	--	8.E-04	3.E-02
			Aroclor 1242	3.E-07	--	1.E-07	5.E-07	Aroclor 1242	NA	--	--	--	--
			Aroclor 1254	8.E-08	--	3.E-08	1.E-07	Aroclor 1254	eyes	6.E-02	--	2.E-02	8.E-02
			Aroclor 1260	8.E-09	--	3.E-09	1.E-08	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	2.E-07	--	1.E-08	2.E-07
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Chloromethane	--	--	--	--	Chloromethane	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	1.E-06	--	4.E-07	2.E-06
			Benzo(a)anthracene	2.E-08	--	8.E-09	3.E-08	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	3.E-08	--	1.E-08	5.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	4.E-09	--	2.E-09	6.E-09	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	1.E-08	--	4.E-09	1.E-08	Dibenz(a,h)anthrancene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	3.E-09	--	1.E-09	4.E-09	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	6.E-08	--	6.E-09	7.E-08	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Nitroglycerin	1.E-07	--	3.E-09	1.E-07	Nitroglycerin	vascular	4.E+00	--	1.E-01	4.3.E+00
			Total	2.E-06	--	3.E-07	2.E-06	Total		6.E+00	--	3.E-01	6.E+00
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	4.0.E+00	--	4.0.E+00
			Antimony	--	--	--	--	Antimony	NA	--	2.E-03	--	2.E-03
			Arsenic	--	7.E-07	--	7.E-07	Arsenic	NA	--	--	--	--
			Cadmium	--	2.E-08	--	2.E-08	Cadmium	respiratory	--	3.E-03	--	3.E-03
			Chromium	--	5.E-06	--	5.E-06	Chromium	respiratory	--	3.E-01	--	3.E-01
			Cobalt	--	2.E-07	--	2.E-07	Cobalt	respiratory	--	3.E-01	--	3.E-01
			Copper	--	--	--	--	Copper	NA	--	--	--	--
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	5.E+00	--	5.E+00
			Mercury	--	--	--	--	Mercury	CNS	--	3.E-03	--	3.E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Zinc	--	--	--	--	Zinc	NA	--	--	--	--
			Aroclor 1242	--	2.E-08	--	2.E-08	Aroclor 1242	NA	--	--	--	--
			Aroclor 1254	--	4.E-09	--	4.E-09	Aroclor 1254	NA	--	--	--	--
			Aroclor 1260	--	4.E-10	--	4.E-10	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	2.E-07	--	2.E-07
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	2.E-09	--	2.E-09
			Chloromethane	--	--	--	--	Chloromethane	brain	--	8.E-09	--	8.E-09
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	4.E-09	--	4.E-09
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	2.E-08	--	2.E-08
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	--	7.E-10	--	7.E-10	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	--	--	--	--	Dibenz(a,h)anthrancene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	3.E-09	--	3.E-09	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			Total	--	6.E-06	--	6.E-06	Total		--	9.E+00	--	9.E+00

TABLE E.1-9.4.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Construction Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil Cont.	Air Cont.	Air (Outdoor Vapors)	2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	1.E-04	--	1.E-04
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	1.E-06	--	1.E-06
			Chloromethane	--	--	--	--	Chloromethane	brain	--	4.E-05	--	4.E-05
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	2.E-05	--	2.E-05
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	9.E-05	--	9.E-05
				--	--	--	--			--	2.E-04	--	2.E-04
Groundwater	Air	Air (Trench Air)	Chloroform	--	4.E-09	--	4.E-09	Chloroform	liver	--	2.E-04	--	2.E-04
				--	4.E-09	--	4.E-09			--	2.E-04	--	2.E-04
						Total Risk Across Soil	9.E-06					Total Hazard Index Across Soil	2.E+01
						Total Risk Across Groundwater	4.E-09					Total Hazard Index Across Groundwater	2.E-04
						Total Risk Across All Media and All Exposure Routes	9.E-06					Total Hazard Index Across All Media and All Exposure Routes	1.5.E+01

Total blood HI across all media =	5.E-01
Total CNS HI across all media =	9.E+00
Total skin HI across all media =	2.E-01
Total respiratory HI across all media =	6.E-01
Total GI tract HI across all media =	1.E+00
Total kidney HI across all media =	5.E-02
Total liver HI across all media =	4.E-01
Total vascular HI across all media =	5.E+00
Total eyes HI across all media =	8.E-02
Total immune system HI across all media =	2.E-02
Total thyroid HI across all media =	2.E-06
Total hair HI across all media =	2.E-02
Total brain HI across all media =	4.E-05
Total fetus HI across all media =	2.E-02

TABLE E.1-9.5.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adult Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	3.E-02	--	1.E-03	3.E-02
			Antimony	--	--	--	--	Antimony	blood	4.E-03	--	1.E-03	5.E-03
			Arsenic	1.E-05	--	2.E-06	1.6.E-05	Arsenic	skin/ vascular	9.E-02	--	1.E-02	1.E-01
			Cadmium	--	--	--	--	Cadmium	kidney	2.E-03	--	3.E-04	2.E-03
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	2.E-02	--	4.E-02	6.E-02
			Cobalt	--	--	--	--	Cobalt	blood	6.E-04	--	2.E-05	6.E-04
			Copper	--	--	--	--	Copper	GI tract	3.E-01	--	1.E-02	3.E-01
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	7.E-02	--	3.E-03	8.E-02
			Manganese	--	--	--	--	Manganese	CNS	3.E-02	--	3.E-02	6.E-02
			Mercury	--	--	--	--	Mercury	immune system	7.E-03	--	4.E-04	8.E-03
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	8.E-03	--	3.E-04	8.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	7.E-02	--	1.E-01	2.E-01
			Zinc	--	--	--	--	Zinc	blood	1.E-02	--	4.E-04	1.E-02
			Aroclor 1242	3.E-06	--	2.E-06	5.1.E-06	Aroclor 1242	NA	--	--	--	--
			Aroclor 1254	8.E-07	--	5.E-07	1.3.E-06	Aroclor 1254	eyes	6.E-02	--	3.E-02	9.E-02
			Aroclor 1260	8.E-08	--	5.E-08	1.E-07	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	7.E-08	--	8.E-09	8.E-08
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Chloromethane	--	--	--	--	Chloromethane	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	6.E-06	--	2.E-06	8.E-06
			Benzo(a)anthracene*	4.E-07	--	2.E-07	6.E-07	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	6.E-07	--	3.E-07	9.E-07	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	7.E-08	--	4.E-08	1.E-07	Benzo(b)fluoranthene*	NA	--	--	--	--
			Dibenz(a,h)anthrancene*	2.E-07	--	9.E-08	3.E-07	Dibenz(a,h)anthrancene*	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene*	5.E-08	--	3.E-08	8.E-08	Indeno(1,2,3-cd)pyrene*	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	6.E-07	--	8.E-08	7.E-07	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Nitroglycerin	1.E-06	--	4.E-08	1.E-06	Nitroglycerin	vascular	2.E+00	--	7.E-02	2.E+00
			Total	2.E-05	--	5.E-06	2.7.E-05	Total		2.E+00	--	3.E-01	3.E+00
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	8.E-04	--	8.E-04
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	4.E-09	--	4.E-09	Arsenic	NA	--	--	--	--
			Cadmium	--	9.E-11	--	9.E-11	Cadmium	respiratory	--	7.E-07	--	7.E-07
			Chromium	--	3.E-08	--	3.E-08	Chromium	respiratory	--	6.E-05	--	6.E-05
			Cobalt	--	1.E-09	--	1.E-09	Cobalt	respiratory	--	5.E-05	--	5.E-05
			Copper	--	--	--	--	Copper	NA	--	--	--	--
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	1.E-03	--	1.E-03
			Mercury	--	--	--	--	Mercury	CNS	--	6.E-07	--	6.E-07
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Zinc	--	--	--	--	Zinc	NA	--	--	--	--
			Aroclor 1242	--	8.E-11	--	8.E-11	Aroclor 1242	NA	--	--	--	--
			Aroclor 1254	--	2.E-11	--	2.E-11	Aroclor 1254	NA	--	--	--	--
			Aroclor 1260	--	2.E-12	--	2.E-12	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	5.E-11	--	5.E-11
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	4.E-13	--	4.E-13
			Chloromethane	--	--	--	--	Chloromethane	brain	--	2.E-12	--	2.E-12
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	8.E-13	--	8.E-13
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	4.E-12	--	4.E-12
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)anthracene*	--	--	--	--	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	--	7.E-12	--	7.E-12	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	--	--	--	--	Benzo(b)fluoranthene*	NA	--	--	--	--
			Dibenz(a,h)anthrancene*	--	--	--	--	Dibenz(a,h)anthrancene*	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene*	--	--	--	--	Indeno(1,2,3-cd)pyrene*	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	2.E-11	--	2.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			Total	--	3.E-08	--	3.E-08	Total		--	2.E-03	--	2.E-03

TABLE E.1-9.5.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adult Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil Cont.	Air Cont.	Air (Outdoor Vapors)	2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	3.E-06	--	3.E-06
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	3.E-08	--	3.E-08
			Chloromethane	--	--	--	--	Chloromethane	brain	--	1.E-06	--	1.E-06
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	5.E-07	--	5.E-07
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	3.E-06	--	3.E-06
				--	--	--	--			--	8.E-06	--	8.E-06
		Air (Indoor Vapors)	2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	1.E-02	--	1.E-02
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	2.E-04	--	2.E-04
			Chloromethane	--	--	--	--	Chloromethane	brain	--	6.E-02	--	6.E-02
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	4.E-02	--	4.E-02
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	3.E-01	--	3.E-01
				--	--	--	--			--	5.E-01	--	5.E-01
Groundwater	Groundwater	Groundwater used as tapwater	Chloroform	--	--	--	--	Chloroform	liver	7.E-02	--	7.E-04	7.E-02
			Total	--	--	--	--	Total		6.6.E-02	--	7.E-04	7.E-02
	Air	Air (Indoor Air)	Chloroform	--	6.E-07	--	6.E-07	Chloroform	liver	--	2.E-03	--	2.E-03
				--	6.E-07	--	6.E-07			--	2.E-03	--	2.E-03
		Air (Shower Air)	Chloroform	--	2.E-04	--	1.6.E-04	Chloroform	liver	--	3.E-01	--	3.E-01
				--	2.E-04	--	2.E-04			--	3.E-01	--	3.E-01

Total Risk Across Soil	2.7.E-05
Total Risk Across Groundwater	1.6.E-04
Total Risk Across All Media and All Exposure Routes	2.E-04

Total Hazard Index Across Soil	3.2.E+00
Total Hazard Index Across Groundwater	4.E-01
Total Hazard Index Across All Media and All Exposure Routes	4.E+00

Total blood HI across all media =	1.E-01
Total CNS HI across all media =	1.E-01
Total skin HI across all media =	1.E-01
Total respiratory HI across all media =	1.E-04
Total GI tract HI across all media =	4.E-01
Total kidney HI across all media =	5.E-01
Total liver HI across all media =	5.E-01
Total vascular HI across all media =	2.E+00
Total eyes HI across all media =	9.E-02
Total immune system HI across all media =	8.E-03
Total thyroid HI across all media =	8.E-06
Total hair HI across all media =	8.E-03
Total brain HI across all media =	6.E-02
Total fetus HI across all media =	1.E-01

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).

TABLE E.1-9.6.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Child Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	3.E-01	--	9.E-03	3.E-01
			Antimony	--	--	--	--	Antimony	blood	4.E-02	--	7.E-03	4.E-02
			Arsenic	3.E-05	--	3.E-06	4.E-05	Arsenic	skin/ vascular	9.E-01	--	7.E-02	1.E+00
			Cadmium	--	--	--	--	Cadmium	kidney	2.E-02	--	2.E-03	2.E-02
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	2.E-01	--	3.E-01	5.E-01
			Cobalt	--	--	--	--	Cobalt	blood	5.E-03	--	2.E-04	6.E-03
			Copper	--	--	--	--	Copper	GI tract	2.E+00	--	7.E-02	2.E+00
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	7.E-01	--	2.E-02	7.E-01
			Manganese	--	--	--	--	Manganese	CNS	3.E-01	--	2.E-01	4.E-01
			Mercury	--	--	--	--	Mercury	immune system	7.E-02	--	3.E-03	7.E-02
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	7.E-02	--	2.E-03	8.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	6.E-01	--	7.E-01	1.E+00
			Zinc	--	--	--	--	Zinc	blood	1.E-01	--	3.E-03	1.E-01
			Aroclor 1242	8.E-06	--	3.E-06	1.E-05	Aroclor 1242	NA	--	--	--	--
			Aroclor 1254	2.E-06	--	8.E-07	3.E-06	Aroclor 1254	eyes	6.E-01	--	2.E-01	8.E-01
			Aroclor 1260	2.E-07	--	7.E-08	3.E-07	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	6.E-07	--	5.E-08	7.E-07
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Chloromethane	--	--	--	--	Chloromethane	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	5.E-05	--	2.E-05	7.E-05
			Benzo(a)anthracene*	3.E-06	--	1.E-06	4.E-06	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	4.E-06	--	2.E-06	6.E-06	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	5.E-07	--	2.E-07	7.E-07	Benzo(b)fluoranthene*	NA	--	--	--	--
			Dibenz(a,h)anthrancene*	1.E-06	--	4.E-07	2.E-06	Dibenz(a,h)anthrancene*	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene*	4.E-07	--	1.E-07	5.E-07	Indeno(1,2,3-cd)pyrene*	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	1.E-06	--	1.E-07	2.E-06	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Nitroglycerin	2.E-06	--	7.E-08	2.E-06	Nitroglycerin	vascular	2.E+01	--	5.E-01	1.7.E+01
			Total	6.E-05	--	1.E-05	7.E-05	Total		2.E+01	--	2.E+00	2.5.E+01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	7.E-03	--	7.E-03
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	8.E-09	--	8.E-09	Arsenic	NA	--	--	--	--
			Cadmium	--	2.E-10	--	2.E-10	Cadmium	respiratory	--	6.E-06	--	6.E-06
			Chromium	--	5.E-08	--	5.E-08	Chromium	respiratory	--	5.E-04	--	5.E-04
			Cobalt	--	2.E-09	--	2.E-09	Cobalt	respiratory	--	4.E-04	--	4.E-04
			Copper	--	--	--	--	Copper	NA	--	--	--	--
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	8.E-03	--	8.E-03
			Mercury	--	--	--	--	Mercury	CNS	--	5.E-06	--	5.E-06
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Zinc	--	--	--	--	Zinc	NA	--	--	--	--
			Aroclor 1242	--	2.E-10	--	2.E-10	Aroclor 1242	NA	--	--	--	--
			Aroclor 1254	--	4.E-11	--	4.E-11	Aroclor 1254	NA	--	--	--	--
			Aroclor 1260	--	4.E-12	--	4.E-12	Aroclor 1260	NA	--	--	--	--
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	4.E-10	--	4.E-10
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	3.E-12	--	3.E-12
			Chloromethane	--	--	--	--	Chloromethane	brain	--	1.E-11	--	1.E-11
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	7.E-12	--	7.E-12
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	4.E-11	--	4.E-11
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)anthracene*	--	--	--	--	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	--	4.E-11	--	4.E-11	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	--	--	--	--	Benzo(b)fluoranthene*	NA	--	--	--	--
			Dibenz(a,h)anthrancene*	--	--	--	--	Dibenz(a,h)anthrancene*	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene*	--	--	--	--	Indeno(1,2,3-cd)pyrene*	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	3.E-11	--	3.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			Total	--	6.E-08	--	6.E-08	Total		--	2.E-02	--	2.E-02

TABLE E.1-9.6.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Child Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil Cont.	Air Cont.	Air (Outdoor Vapors)	2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	5.E-05	--	5.E-05
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	6.E-07	--	6.E-07
			Chloromethane	--	--	--	--	Chloromethane	brain	--	2.E-05	--	2.E-05
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	8.E-06	--	8.E-06
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	4.E-05	--	4.E-05
				--	--	--	--			--	1.E-04	--	1.E-04
		Air (Indoor Vapors)	2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	5.E-02	--	5.E-02
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	6.E-04	--	6.E-04
			Chloromethane	--	--	--	--	Chloromethane	brain	--	2.E-01	--	2.E-01
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	1.E-01	--	1.E-01
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	1.E+00	--	1.E+00
				--	--	--	--			--	1.E+00	--	1.E+00
Groundwater	Groundwater	Groundwater used as tapwater	Chloroform	--	--	--	--	Chloroform	liver	2.E-01	--	2.E-03	2.E-01
			Total	--	--	--	--	Total		2.E-01	--	2.E-03	2.E-01
	Air	Air (Indoor Air)	Chloroform	--	5.E-07	--	5.E-07	Chloroform	liver	--	5.E-03	--	5.E-03
				--	5.E-07	--	5.E-07			--	5.E-03	--	5.E-03

Total Risk Across Soil	7.E-05
Total Risk Across Groundwater	5.E-07
Total Risk Across All Media and All Exposure Routes	7.E-05

Total Hazard Index Across Soil	2.6.E+01
Total Hazard Index Across Groundwater	2.E-01
Total Hazard Index Across All Media and All Exposure Routes	2.6.E+01

Total blood HI across all media =	9.E-01
Total CNS HI across all media =	8.E-01
Total skin HI across all media =	1.E+00
Total respiratory HI across all media =	1.E-03
Total GI tract HI across all media =	4.E+00
Total kidney HI across all media =	2.E+00
Total liver HI across all media =	1.E+00
Total vascular HI across all media =	1.8.E+01
Total eyes HI across all media =	8.E-01
Total immune system HI across all media =	7.E-02
Total thyroid HI across all media =	7.E-05
Total hair HI across all media =	8.E-02
Total brain HI across all media =	2.E-01
Total fetus HI across all media =	6.E-01

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).

TABLE E.1-9.7.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Lifetime Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--
			Antimony	--	--	--	--
			Arsenic	5.E-05	--	--	4.8.E-05
			Cadmium	--	--	--	--
			Chromium	--	--	--	--
			Cobalt	--	--	--	--
			Copper	--	--	--	--
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Mercury	--	--	--	--
			Thallium	--	--	--	--
			Vanadium	--	--	--	--
			Zinc	--	--	--	--
			Aroclor 1242	1.E-05	--	2.E-06	1.3.E-05
			Aroclor 1254	3.E-06	--	1.E-05	1.3.E-05
			Aroclor 1260	3.E-07	--	7.E-05	6.7.E-05
			2-Hexanone	--	--	--	--
			4-Methyl-2-Pentanone	--	--	--	--
			Chloromethane	--	--	--	--
			Cyclohexane	--	--	--	--
			Methylcyclohexane	--	--	--	--
			Di-n-octylphthalate	--	--	--	--
			Benzo(a)anthracene*	3.E-06	--	2.E-07	3.E-06
			Benzo(a)pyrene*	5.E-06	--	--	5.E-06
			Benzo(b)fluoranthene*	6.E-07	--	--	6.E-07
			Dibenz(a,h)anthrancene*	1.E-06	--	--	1.E-06
			Indeno(1,2,3-cd)pyrene*	4.E-07	--	--	4.E-07
			2,3,7,8-TCDD TEQ	2.E-06	--	--	2.E-06
			Nitroglycerin	3.E-06	--	--	3.E-06
			Total	7.8.E-05	--	7.9.E-05	1.6.E-04
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--
			Antimony	--	--	--	--
			Arsenic	--	1.E-08	--	1.E-08
			Cadmium	--	9.E-11	--	9.E-11
			Chromium	--	--	--	--
			Cobalt	--	--	--	--
			Copper	--	--	--	--
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Mercury	--	--	--	--
			Thallium	--	--	--	--
			Vanadium	--	--	--	--
			Zinc	--	--	--	--
			Aroclor 1242	--	--	--	--
			Aroclor 1254	--	--	--	--
			Aroclor 1260	--	4.E-11	--	4.E-11
			2-Hexanone	--	--	--	--
			4-Methyl-2-Pentanone	--	--	--	--
			Chloromethane	--	--	--	--
			Cyclohexane	--	--	--	--
			Methylcyclohexane	--	--	--	--
			Di-n-octylphthalate	--	--	--	--
			Benzo(a)anthracene*	--	--	--	--
			Benzo(a)pyrene*	--	--	--	--
			Benzo(b)fluoranthene*	--	--	--	--
			Dibenz(a,h)anthrancene*	--	--	--	--
			Indeno(1,2,3-cd)pyrene*	--	--	--	--
			2,3,7,8-TCDD TEQ	--	--	--	--
			Nitroglycerin	--	--	--	--
			Total	--	1.E-08	--	1.E-08

TABLE E.1-9.7.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Lifetime Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil Cont.	Air Cont.	Air (Outdoor Vapors)	2-Hexanone	--	--	--	--
			4-Methyl-2-Pentanone	--	--	--	--
			Chloromethane	--	--	--	--
			Cyclohexane	--	--	--	--
			Methylcyclohexane	--	--	--	--
				--	--	--	--
		Air (Indoor Air)	2-Hexanone	--	--	--	--
			4-Methyl-2-Pentanone	--	--	--	--
			Chloromethane	--	--	--	--
			Cyclohexane	--	--	--	--
			Methylcyclohexane	--	--	--	--
				--	--	--	--
Groundwater	Groundwater	Groundwater used as tapwater	Chloroform	--	--	--	--
			Total	--	--	--	--
	Air	Air (Indoor Air)	Chloroform	--	1.E-06	--	1.E-06
				--	1.E-06	--	1.E-06
		Air (Shower Air)	Chloroform	--	2.E-04	--	2.E-04
				--	2.E-04	--	2.E-04
						Total Risk Across Soil	2.E-04
						Total Risk Across Groundwater	2.E-04

Total Risk Across All Media and All Exposure Routes	3.E-04

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).

TABLE E.1-10.1.RME
RME Risk Assessment Summary: Construction Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	None Identified					Arsenic	skin/ vascular	2.E-01	--	2.E-02	2.4.E-01
								Nitroglycerin	vascular	4.E+00	--	1.E-01	4.3.E+00
			Total	--	--	--	--	Total		4.4.E+00	--	1.E-01	5.E+00
	Air	Air	None Identified					Aluminum	CNS	--	4.E+00	--	4.E+00
								Manganese	CNS	--	5.E+00	--	5.E+00
			Total	--	--	--	--	Total		--	9.E+00	--	9.E+00
Groundwater	Groundwater	Groundwater	None Identified					None Identified					
			Total	--	--	--	--	Total		--	--	--	--
							Total Risk Across Soil	--					Total Hazard Index Across Soil	1.E+01
							Total Risk Across Groundwater	--					Total Hazard Index Across Groundwater	--
							Total Risk Across All Media and All Exposure Routes	--					Total Hazard Index Across All Media and All Exposure Routes	1.E+01

Total CNS HI across all media =	9.E+00
Total vascular HI across all media =	5.E+00

TABLE E.1-10.2.RME
RME Risk Assessment Summary: Adult Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Non-Carcinogenic Hazard Quotient				
				Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Nitroglycerin	vascular	2.E+00	--	7.E-02	2.E+00
			Total		2.E+00	--	7.E-02	2.E+00
	Air	Air	None Identified					
			Total		--	--	--	--
Groundwater	Groundwater	Groundwater Used as Tapwater	None Identified					
			Total		--	--	--	--
							Total Hazard Index Across Soil	2.E+00
							Total Hazard Index Across Groundwater	--

Total Hazard Index Across All Media and All Exposure Routes: 2.E+00

Total vascular HI across all media = 2.E+00

TABLE E.1-10.3.RME
RME Risk Assessment Summary: Child Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Non-Carcinogenic Hazard Quotient				
				Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Arsenic	skin/ vascular	9.E-01	--	7.E-02	1.E+00
			Chromium	GI tract/fetus/bone marrow/liver	2.E-01	--	3.E-01	5.E-01
			Copper	GI tract	2.E+00	--	7.E-02	2.5.E+00
			Iron	blood/ liver/ GI tract	7.E-01	--	2.E-02	7.E-01
			Vanadium	kidney	6.E-01	--	7.E-01	1.E+00
			Nitroglycerin	vascular	2.E+01	--	5.E-01	1.7.E+01
			Total		2.E+01	--	2.E+00	2.3.E+01
	Air	Air (Indoor Air)	Methylcyclohexane	kidney	--	1.E+00	--	1.E+00
			Total		--	1.E+00	--	1.E+00
Groundwater	Groundwater	Groundwater Used as Tapwater	None Identified					
			Total		--	--	--	--
							Total Hazard Index Across Soil	2.4.E+01
							Total Hazard Index Across Groundwater	--

Total Hazard Index Across All Media and All Exposure Routes	2.4.E+01

Total blood HI across all media =	7.E-01
Total skin HI across all media =	1.E+00
Total GI tract HI across all media =	3.7.E+00
Total kidney HI across all media =	2.4.E+00
Total liver HI across all media =	1.E+00
Total vascular HI across all media =	1.8.E+01

TABLE E.1-10.4.RME
RME Risk Assessment Summary: Lifetime Resident - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Arsenic	5.E-05	--	--	5.E-05
			Aroclor 1242	1.E-05	--	2.E-06	1.E-05
			Aroclor 1254	3.E-06	--	1.E-05	1.E-05
			Aroclor 1260	3.E-07	--	7.E-05	7.E-05
			Total	6.E-05	--	8.E-05	1.4.E-04
	Air	Air	None Identified				
			Total	--	--	--	--
Groundwater	Air	Shower Air	Chloroform	--	1.6.E-04	--	1.6.E-04
			Total	--	2.E-04	--	1.6.E-04
						Total Risk Across Soil	1.4.E-04
						Total Risk Across Groundwater	1.6.E-04

Total Risk Across All Media and All Exposure Routes	3.E-04

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IRON MARGIN OF EXPOSURE EVALUATION

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Table 1
Iron "Margin of Exposure" Evaluation
SMWUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Total Soil - Child Resident - SWMU 40				
Iron EPC (mg/kg)	Child Daily Intake Estimate* (mg/day)	RDA for Child 6 mths to 4 years Old	Child Daily Intake** (mg/kg-day)	Provisional RfD (mg/kg-day)
37,114	7.1	10 mg/day	0.48	0.7
Total Soil - Child Resident - SWMU 71				
Iron EPC (mg/kg)	Child Daily Intake Estimate* (mg/day)	RDA for Child 6 mths to 4 years Old	Child Daily Intake** (mg/kg-day)	Provisional RfD (mg/kg-day)
39,769	7.6	10 mg/day	0.51	0.7

* See Table 2 for equations used to calculated daily intake estimates.
** Default weight of 15 kg used for child

Table 2
Iron "Margin of Exposure" Evaluation
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation
Ingestion-Total Soil	Resident	Child	SWMU 40/71	AT-NC	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991a	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	Chronic
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	MDC or EPC	Daily = $\frac{CS*IRS*EF*ED*FI*CF1}{BW*AT}$
				ED	Exposure Duration	6	years	USEPA, 1991a	Intake
				EF	Exposure Frequency	350	days/year	USEPA, 1991a	(mg/day)
				FI	Fraction Ingested	1	(unitless)	default	
				IRS	Ingestion Rate of Soil	200	mg/day	USEPA, 1991a	

LEAD IEUBK MODEL RESULTS

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LEAD MODEL FOR WINDOWS Version 1.0

==========
Model Version: 1.0 Build 263
User Name: Tina DeVine
Date: 11/26/2007
Site Name: SWMU 40-RFAAP
Operable Unit: SWMU 40
Run Mode: Site Risk Assessment

Water Data
Maximum detected concentration of lead in GW
==========
The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 0.510 ug Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 48.360 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	54.800	48.360
1-2	54.800	48.360
2-3	54.800	48.360
3-4	54.800	48.360
4-5	54.800	48.360
5-6	54.800	48.360
6-7	54.800	48.360

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

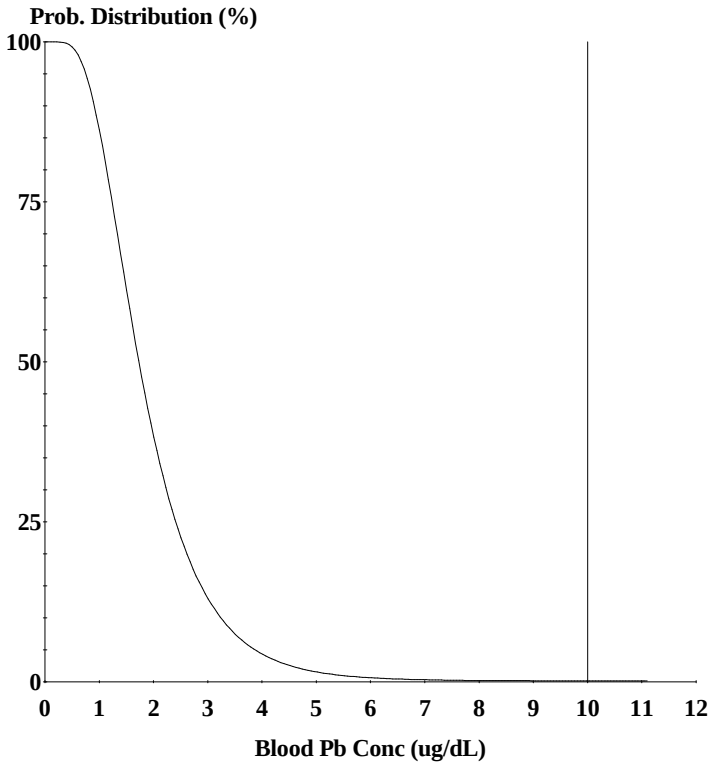
****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 2.500 ug Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.644	0.000	0.049
1-2	0.034	2.770	0.000	0.122
2-3	0.062	3.121	0.000	0.128
3-4	0.067	3.020	0.000	0.131
4-5	0.067	2.931	0.000	0.137
5-6	0.093	3.100	0.000	0.145
6-7	0.093	3.425	0.000	0.147

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	1.250	3.964	2.2
1-2	1.989	4.916	2.1
2-3	1.997	5.308	2.0
3-4	2.009	5.227	1.9
4-5	1.500	4.635	1.6
5-6	1.354	4.692	1.5
6-7	1.279	4.945	1.4



Cutoff = 10.000 ug/dl
Geo Mean = 1.815
GSD = 1.600
% Above = 0.014

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment

Table 1
Calculation of Blood Lead Concentrations using ALM - Commercial Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1, GSDi = Hom	Using Equation 1, GSDi = Het	Using Equation 2, GSDi = Hom	Using Equation 2, GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	54.8	54.8	54.8	54.8
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.050	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S,D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S,D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	250	250	250	250
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**1.6**	**1.8**	**1.6**	**1.8**
$PbB_{fetal,\ 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**4.8**	**6.3**	**4.8**	**6.3**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**0.4%**	**1.4%**	**0.4%**	**1.4%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 2
Calculation of Blood Lead Concentrations using ALM - Construction Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
					Using Equation 1		Using Equation 2	
					GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	54.8	54.8	54.8	54.8
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.330	0.330	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.330	0.330
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S,D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S,D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	250	250	250	250
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**2.1**	**2.3**	**2.1**	**2.3**
$PbB_{fetal,\ 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**6.4**	**8.1**	**6.4**	**8.1**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**1.2%**	**2.9%**	**1.2%**	**2.9%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 3
Calculation of Blood Lead Concentrations using ALM - Maintenance Worker - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1 GSDi = Hom	Using Equation 1 GSDi = Het	Using Equation 2 GSDi = Hom	Using Equation 2 GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	27.5	27.5	27.5	27.5
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.100	0.100
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S,D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S,D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**1.6**	**1.8**	**1.6**	**1.8**
$PbB_{fetal,\ 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**4.8**	**6.3**	**4.8**	**6.3**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**0.4%**	**1.4%**	**0.4%**	**1.4%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal,\ 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

APPENDIX E.2

SWMU 71 HHRA

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Table E.2-1
Selection of Exposure Pathways - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil	Surface Soil	Surface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
		Air	Ambient Air Above Surface Soil (Particulates and Vapors)	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest subsurface soil from the site since maintenance does not include excavation.
						Dermal Absorption	None	Receptor is not likely to come in contact with subsurface soil from the site since maintenance does not include excavation.
		Air	Ambient Air Above Subsurface Soil (Particulates and Vapors)	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale particulates and vapors from ambient air above the subsurface soil since maintenance activities do not include excavation.
	Groundwater [1]	Groundwater	Groundwater	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest groundwater from the site during maintenance activities.
						Dermal Absorption	None	Receptor is not likely to contact groundwater from the site during maintenance activities.
		Air	Upward Migration of Vapors from Groundwater (Outdoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.
			Upward Migration of Vapors from Groundwater (Indoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
			Vapors while Showering	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
Future	Surface Soil	Surface Soil	Surface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
				Commerical/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil while working on site.
						Dermal Absorption	Quant	Receptor could contact surface soil while working on site.
				Construction Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site during construction activities.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site during construction activities.
				Resident	Child	Ingestion	Quant	Receptor could ingest surface soil while living on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while living on site.
					Adult	Ingestion	Quant	Receptor could ingest surface soil while living on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while living on site.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Ambient Air Above Surface Soil (Particulates and Vapors)	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil while working on site.
				Commerical/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil while working on site.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil while working on site.
				Resident	Child	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil while living on site.
					Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the surface soil while living on site.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.

Table E.2-1
Selection of Exposure Pathways - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Surface Soil Cont.	Air Cont.	Upward Migration of Vapors from Soil (Indoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Commercial/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale VOCs from soil via vapor intrusion into building.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Resident	Adult	Inhalation	Quant	Receptor could inhale VOCs from soil via vapor intrusion into residence.
					Child	Inhalation	Quant	Receptor could to inhale VOCs from soil via vapor intrusion into residence.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident. [1]
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction activities while conducting routine maintenance activities.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction activities while conducting routine maintenance activities.
				Commerical/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
						Dermal Absorption	Quant	Receptor could contact subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
				Construction Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil from the site while during construction activities.
						Dermal Absorption	Quant	Receptor could come into contact with subsurface soil from the site during construction activities.
				Resident	Child	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a residence.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction of a residence.
					Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a residence.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction of a residence.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Ambient Air Above Subsurface Soil (Particulates and Vapors)	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the subsurface soil when mixed with surface soil from construction activities while conducting routine maintenance activities.
				Commerical/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the subsurface soil during construction activities.
				Resident	Child	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the subsurface soil when mixed with surface soil from construction of a residence.
					Adult	Inhalation	Quant	Receptor could inhale particulates and vapors from ambient air above the subsurface soil when mixed with surface soil from construction of a residence.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.

Table E.2-1
Selection of Exposure Pathways - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Subsurface Soil Cont.	Air Cont.	Upward Migration of Vapors from Soil (Indoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Commercial/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale VOCs from soil via vapor intrusion into building.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Resident	Adult	Inhalation	Quant	Receptor could inhale VOCs from soil via vapor intrusion into residence.
					Child	Inhalation	Quant	Receptor could inhale VOCs from soil via vapor intrusion into residence.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
	Groundwater [1]	Groundwater	Groundwater	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest groundwater from the site during maintenance activities.
						Dermal Absorption	None	Receptor is not likely to contact groundwater from the site during maintenance activities.
				Commercial/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply for industrial process.
				Construction Worker	Adult	Ingestion	None	Due to the depth to groundwater (approximately 90-100 ft bgs), the receptor is not likely to ingest groundwater during excavation activities.
						Dermal Absorption	None	Due to the depth to groundwater (approximately 90-100 ft bgs), the receptor is not likely to contact groundwater during excavation activities.
				Resident	Adult	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply.
					Child	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to groundwater. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Upward Migration of Vapors from Groundwater (Outdoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.
				Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale vapors that migrated upward from groundwater to during excavation activities.
				Resident	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.
					Child	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.
					Child/Adult	Inhalation	None	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to groundwater. The non-cancer hazard evaluations are treated separately for child and adult resident.[2]
			Upward Migration of Vapors from Groundwater (Indoors)	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Commercial/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale VOCs from groundwater via vapor intrusion into building.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Resident	Adult	Inhalation	Quant	Receptor could inhale VOCs from groundwater via vapor intrusion into residence.
					Child	Inhalation	Quant	Receptor could inhale VOCs from groundwater via vapor intrusion into residence.

Table E.2-1
Selection of Exposure Pathways - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Groundwater Cont.	Air Cont.	Upward Migration of Vapors from Groundwater (Indoors) Cont.	Resident Cont.	Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to groundwater. The non-cancer hazard evaluations are treated separately for child and adult resident.[2]
			Vapors while Showering	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
				Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
				Resident	Adult	Inhalation	Quant	Receptor could inhale vapors from groundwater while showering.
					Child	Inhalation	None	Receptor is assumed not to shower.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to groundwater. Since the shower scenario applies only to the adult resident, the lifetime resident exposure will be equivalent to that of the adult resident.[2]

Notes:

[1] Groundwater from the surface aquifer is not currently used at the sites for potable or non-potable water supply.

Table E.2-2.1
SWMU 71 COPC Determination - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Surface Soil		**TAL Metals (mg/kg)**															
	7429-90-5	Aluminum	3,460	33,000	mg/kg	71SB12A	7/7	1.6 - 79	33,000	40,041	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.2	16.4	mg/kg	71SS13	7/7	0.036 - 0.37	16.4	--	3.13	N	40.88	N	IND	Y	**ARES**
	7440-38-2	Arsenic	4.7	16.1	mg/kg	71SS12 DUP AVG	7/7	0.023 - 0.35	16.1	15.8	0.426	C	1.91	C	IND	Y	***ARES/IND***
	7440-39-3	Barium	51.3	180	mg/kg	71SB16A	7/7	0.02 - 0.1	180	209	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.29	1.6	mg/kg	71SB12A	7/7	0.01 - 0.02	1.6	1.02	15.64	N	204.4	N	IND	N	BSL
	7440-43-9	Cadmium	0.03	0.31	mg/kg	71SS12 DUP AVG	6/7	0.0073 - 0.04	0.31	0.69	3.91	N	51.1	N	IND	N	BSL
	7440-70-2	Calcium	2,610	172,000	mg/kg	71SS12 DUP AVG	7/7	0.96 - 10	172,000	--	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium[1]	11	47	mg/kg	71SB12A	7/7	0.06 - 0.57	47	65.3	23.46	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	2.65	13	mg/kg	71SB12A	7/7	0.06 - 0.35	13	72.3	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	15.8	40	mg/kg	71SB16A	7/7	0.022 - 0.17	40	53.5	312.86	N	4,088	N	IND	N	BSL
	7439-89-6	Iron	6,730	34,000	mg/kg	71SB12A	7/7	1.3 - 23	34,000	50,962	5,475	N	71,540	N	IND	Y	**ARES**
	7439-92-1	Lead[2]	9.9	366	mg/kg	71SS13	7/7	0.041 - 0.23	366	26.8	400	--	750	--	AL	N	BSL
	7439-95-4	Magnesium	1,290	74,800	mg/kg	71SS11	7/7	0.61 - 170	74,800	--	--	--	156,400	--	RDA	N	BSL
	7439-96-5	Manganese	83.7	550	mg/kg	71SB12A	7/7	0.02 - 0.14	550	2,543	156.4	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury[3]	0.019	0.49	mg/kg	71SB13A	7/7	0.0048 - 0.018	0.49	0.13	2.346	N	30.66	N	IND	N	BSL
	7440-02-0	Nickel	6.7	33	mg/kg	71SB12A	7/7	0.027 - 0.12	33	62.8	156.4	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	378	4,500	mg/kg	71SB12A	7/7	4.2 - 11.9	4,500	--	--	--	2,607,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.25	1.1	mg/kg	71SS13	5/7	0.063 - 0.35	1.1	--	39.11	N	511	N	IND	N	BSL
	7440-22-4	Silver	0.12	2.1	mg/kg	71SS12 DUP AVG	5/7	0.017 - 0.09	2.1	--	39.11	N	511	N	IND	N	BSL
	7440-23-5	Sodium	100	358	mg/kg	71SS13	6/7	19 - 35.2	358	--	--	--	625,700	--	RDA	N	BSL
	7440-28-0	Thallium	0.35	0.59	mg/kg	71SB13A	3/6	0.0085 - 0.28	0.59	2.11	0.548	N	7.154	N	IND	Y	**ARES**
	7440-62-2	Vanadium	11.6	91	mg/kg	71SB12A	7/7	0.024 - 0.08	91	108	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	24.5	152	mg/kg	71SS13	7/7	0.1 - 1.7	152	202	2,346	N	30,660	N	IND	N	BSL
		Pesticides/PCBs															
	309-00-2	Aldrin	8.6E-04	1.1E-03	mg/kg	71SS12 DUP AVG	2/4	0.00017 - 0.00017	1.1E-03	--	3.8E-02	C	1.7E-01	C	IND	N	BSL
	319-85-7	beta-BHC	3.4E-03	5.5E-03	mg/kg	71SB11A	2/4	0.00028 - 0.00028	5.5E-03	--	3.5E-01	C	1.6E+00	C	IND	N	BSL
	58-89-9	gamma-BHC (Lindane)	9.9E-04	9.9E-04	mg/kg	71SB11A	1/4	0.00022 - 0.00022	9.9E-04	--	4.9E-01	C	2.2E+00	C	IND	N	BSL
	12672-29-6	Aroclor 1248	4.5E-01	4.5E-01	mg/kg	71SB13A	1/7	0.0044 - 0.0091	4.5E-01	--	3.2E-01	C	1.4E+00	C	IND	Y	**ARES**
	11097-69-1	Aroclor 1254[4]	2.4E-02	4.6E-01	mg/kg	71SB13A	6/7	0.0071 - 0.009	4.6E-01	--	1.6E-01	N	1.4E+00	C	IND	Y	**ARES**
	11096-82-5	Aroclor 1260	3.5E-02	9.2E-02	mg/kg	71SB13A	2/7	0.0052 - 0.0092	9.2E-02	--	3.2E-01	C	1.4E+00	C	IND	N	BSL
		TCL VOCs															
	78-93-3	2-Butanone	1.7E-02	4.6E-02	mg/kg	71SB11A	3/4	0.001 - 0.004	4.6E-02	--	4.7E+03	N	6.1E+04	N	IND	N	BSL
	108-10-1	4-Methyl-2-Pentanone	2.0E-03	1.6E-02	mg/kg	71SS12 DUP AVG	3/4	0.0006 - 0.002	1.6E-02	--	--	--	--	--	--	Y	NSV
	67-64-1	Acetone	5.4E-02	2.5E-01	mg/kg	71SB11A	4/4	0.001 - 0.003	2.5E-01	--	7.0E+03	N	9.2E+04	N	IND	N	BSL
	71-43-2	Benzene	1.0E-03	3.2E-03	mg/kg	71SS12 DUP AVG	2/4	0.0004 - 0.001	3.2E-03	--	1.2E+01	C	5.2E+01	C	IND	N	BSL
	74-83-9	Bromomethane	2.0E-03	2.0E-03	mg/kg	71SS13	1/4	0.001 - 0.003	2.0E-03	--	1.1E+01	N	1.4E+02	N	IND	N	BSL
	75-15-0	Carbon Disulfide	2.0E-03	7.5E-03	mg/kg	71SS12 DUP AVG	4/4	0.0005 - 0.002	7.5E-03	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	110-82-7	Cyclohexane	4.0E-03	4.0E-03	mg/kg	71SS12 DUP AVG	1/4	0.0005 - 0.001	4.0E-03	--	--	--	--	--	--	Y	NSV
	75-71-8	Dichlorodifluoromethane	1.0E-03	1.0E-03	mg/kg	71SB11A	1/4	0.0005 - 0.001	1.0E-03	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	100-41-4	Ethylbenzene	5.0E-03	5.0E-03	mg/kg	71SS12 DUP AVG	1/4	0.0004 - 0.001	5.0E-03	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	108-87-2	Methylcyclohexane	2.7E-02	2.7E-02	mg/kg	71SS12 DUP AVG	1/4	0.0005 - 0.001	2.7E-02	--	--	--	--	--	--	Y	NSV
	75-09-2	Methylene Chloride	6.0E-03	1.6E-02	mg/kg	71SS12 DUP AVG	2/4	0.0005 - 0.002	1.6E-02		8.5E+01	C	3.8E+02	C	IND	N	BSL
	100-42-5	Styrene	1.0E-03	1.0E-03	mg/kg	71SB11A	1/4	0.0003 - 0.0008	1.0E-03	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	108-88-3	Toluene	1.0E-03	1.3E-02	mg/kg	71SS12 DUP AVG	4/4	0.0004 - 0.001	1.3E-02	--	6.3E+02	N	8.2E+03	N	IND	N	BSL
	79-01-6	Trichloroethene	1.0E-03	2.1E-02	mg/kg	71SS12 DUP AVG	4/4	0.0004 - 0.001	2.1E-02	--	1.6E+00	C	7.2E+00	C	IND	N	BSL
	1330-20-7	Xylenes (Total)	2.0E-03	6.1E-02	mg/kg	71SS12 DUP AVG	4/4	0.001 - 0.004	6.1E-02	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
		TCL SVOCs															
	91-57-6	2-Methylnaphthalene	3.3E-02	7.8E-02	mg/kg	71SS13	3/4	0.024 - 0.024	7.8E-02	--	3.1E+01	N	4.1E+02	N	IND	N	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	4.7E-02	5.8E-02	mg/kg	71SS12 DUP AVG	3/4	0.032 - 0.032	5.8E-02	--	4.6E+01	C	2.0E+02	C	IND	N	BSL
		TCL PAHs															
	83-32-9	Acenaphthene	1.2E-01	1.4E-01	mg/kg	71SS13	2/4	0.0059 - 0.0059	1.4E-01	--	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene[5]	1.2E-01	1.2E-01	mg/kg	71SS13	1/4	0.0059 - 0.0059	1.2E-01	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	2.6E-02	3.6E-02	mg/kg	71SS13	2/4	0.0022 - 0.0022	3.6E-02	--	2.2E-01	C	3.9E+00	C	IND	N	BSL
	50-32-8	Benzo(a)pyrene	5.4E-03	2.0E-02	mg/kg	71SS13	2/4	0.0016 - 0.0016	2.0E-02	--	2.2E-02	C	3.9E-01	C	IND	N	BSL
	205-99-2	Benzo(b)fluoranthene	1.0E-02	1.5E-02	mg/kg	71SS13	2/4	0.0017 - 0.0017	1.5E-02	--	2.2E-01	C	3.9E+00	C	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	7.9E-03	1.7E-02	mg/kg	71SS13	2/4	0.0014 - 0.0014	1.7E-02	--	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	9.0E-03	5.4E-02	mg/kg	71SS13	2/4	0.0024 - 0.0024	5.4E-02	--	2.2E+01	C	3.9E+02	C	IND	N	BSL
	206-44-0	Fluoranthene	3.1E-02	2.3E-01	mg/kg	71SS12 DUP AVG	4/4	0.0021 - 0.0021	2.3E-01	--	3.1E+02	N	4.1E+03	N	IND	N	BSL
	91-20-3	Naphthalene	4.4E-02	1.2E-01	mg/kg	71SS13	2/4	0.014 - 0.014	1.2E-01	--	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene[5]	6.7E-02	6.7E-02	mg/kg	71SS13	1/4	0.0085 - 0.0085	6.7E-02	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	2.2E-02	2.2E-02	mg/kg	71SS12 DUP AVG	1/4	0.0043 - 0.0043	2.2E-02	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
		Dioxin/Furans															
	--	2,3,7,8-TCDD TEQ[6]	3.0E-06	3.6E-06	mg/kg	71SS11	2/2	--	3.6E-06	--	4.3E-06	C	1.9E-05	C	IND	N	BSL
		DRO															
	--	DRO[7]	4.9E+00	4.6E+01	mg/kg	71SB13A	3/3	0.99 - 1.1	4.6E+01	--	--	--	1.0E+02	--	VDEQ	N	BSL

Table E.2-2.1
SWMU 71 COPC Determination - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
ARAR = Applicable, Relevant, and Appropriate Requirement
TBC = To-Be-Considered
RDA = Recommended Daily Allowance Based Screening Level

RBC = USEPA Region III Risk-Based Concentration
(RBC) values from the October 11, 2007,
RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
C/N = Carcinogenic/Noncarcinogenic per EPA RBC Table (October 2007)
IND = Adjusted Industrial RBC
VDEQ = Virginia Department of Environmental Qualtiy Screening Level

ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[5] = Pyrene RBC value was used
[6] = See Table 6-3 for 2,3,7,8-TCDD TEQ Calculations
[7] = VDEQ TPH Screening Level used

Table E.2-2.2
SWMU 71 COPC Determination - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Surface Soil		**TAL Metals**															
	7429-90-5	Aluminum	3,460	69,000	mg/kg	71SB12B	19/19	1.6 - 160	69,000	40,041	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.061	16.4	mg/kg	71SS13	13/19	0.036 - 0.49	16.4	--	3.13	N	40.88	N	IND	Y	**ARES**
	7440-38-2	Arsenic	0.32	16.1	mg/kg	71SS12 DUP AVG	19/19	0.023 - 0.35	16.1	15.8	0.426	C	1.91	C	IND	Y	***ARES/IND***
	7440-39-3	Barium	50	180	mg/kg	71SB16A	19/19	0.02 - 0.1	180	209	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.29	3.2	mg/kg	71SB12B	19/19	0.01 - 0.02	3.2	1.02	15.64	N	204.4	N	IND	N	BSL
	7440-43-9	Cadmium	0.017	0.43	mg/kg	71SB11F	18/19	0.0073 - 0.05	0.43	0.69	3.91	N	51.1	N	IND	N	BSL
	7440-70-2	Calcium	1,000	172,000	mg/kg	71SS12 DUP AVG	19/19	0.96 - 10	172,000	--	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium[1]	11	66	mg/kg	71SB11F	19/19	0.06 - 0.57	66	65.3	23.46	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	2.65	22	mg/kg	71SS12B	19/19	0.06 - 0.35	22	72.3	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	6.4	40	mg/kg	71SB16A	19/19	0.022 - 0.18	40	53.5	312.86	N	1,040	N	IND	N	BSL
	7439-89-6	Iron	6,730	62,000	mg/kg	71SB12B	19/19	1.3 - 46	62,000	50,962	5,475	N	1,410	N	IND	Y	***ARES/IND***
	7439-92-1	Lead[2]	1.3	366	mg/kg	71SS13	19/19	0.041 - 0.3	366	26.8	400	--	750	--	AL	N	BSL
	7439-95-4	Magnesium	1,290	74,800	mg/kg	71SS11	19/19	0.61 - 340	74,800	--	--	--	156,000	--	RDA	N	BSL
	7439-96-5	Manganese	83.7	550	mg/kg	71SB12A	19/19	0.02 - 1.4	550	2,543	156.4	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury[3]	0.0099	0.49	mg/kg	71SB13A	18/19	0.0048 - 0.022	0.49	0.13	2.346	N	30.7	N	IND	N	BSL
	7440-02-0	Nickel	6.7	46	mg/kg	71SB12B	19/19	0.027 - 0.13	46	62.8	156.4	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	378	6,900	mg/kg	71SB13B	19/19	4.2 - 15.5	6,900	--	--	--	2,610,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.15	2	mg/kg	71SB11B	17/19	0.063 - 0.43	2	--	39.11	N	511	N	IND	N	BSL
	7440-22-4	Silver	0.11	2.1	mg/kg	71SS12 DUP AVG	15/19	0.017 - 0.09	2.1	--	39.11	N	511	N	IND	N	BSL
	7440-23-5	Sodium	50	358	mg/kg	71SS13	11/19	19 - 35.2	358	--	--	--	625,700	--	RDA	N	BSL
	7440-28-0	Thallium	0.19	0.59	mg/kg	71SB13A	12/15	0.0085 - 0.28	0.59	2.11	0.548	N	7.154	N	IND	Y	**ARES**
	7440-62-2	Vanadium	11.6	130	mg/kg	71SB12B	19/19	0.024 - 0.12	130	108	7.82	N	102.2	N	IND	Y	***ARES/IND***
	7440-66-6	Zinc	24.5	152	mg/kg	71SS13	19/19	0.1 - 1.7	152	202	2,346	N	30,660	N	IND	N	BSL
		Pesticides/PCBs															
	309-00-2	Aldrin	8.6E-04	1.1E-03	mg/kg	71SS12 DUP AVG	2/4	0.00017 - 0.00017	1.1E-03	--	3.8E-02	C	1.7E-01	C	IND	N	BSL
	319-85-7	beta-BHC	3.4E-03	5.5E-03	mg/kg	71SB11A	2/4	0.00028 - 0.00028	5.5E-03	--	3.5E-01	C	1.6E+00	C	IND	N	BSL
	58-89-9	gamma-BHC (Lindane)	9.9E-04	9.9E-04	mg/kg	71SB11A	1/4	0.00022 - 0.00022	9.9E-04	--	4.9E-01	C	2.2E+00	C	IND	N	BSL
	12674-11-2	Aroclor 1016[4]	6.8E-02	6.8E-02	mg/kg	71SB11F	1/19	0.0051 - 0.015	6.8E-02	--	5.5E-01	C	7.2E+00	C	IND	N	BSL
	12672-29-6	Aroclor 1248	4.5E-01	4.5E-01	mg/kg	71SB13A	1/19	0.0044 - 0.0091	4.5E-01	--	3.2E-01	C	1.4E+00	C	IND	Y	**ARES**
	11097-69-1	Aroclor 1254[5]	1.3E-02	4.6E-01	mg/kg	71SB13A	9/19	0.0071 - 0.0092	4.6E-01	--	1.6E-01	C	1.4E+00	C	IND	Y	**ARES**
	11096-82-5	Aroclor 1260	3.5E-02	9.2E-02	mg/kg	71SB13A	3/19	0.0052 - 0.0092	9.2E-02	--	3.2E-01	C	1.4E+00	C	IND	N	BSL
		TCL VOCs															
	78-93-3	2-Butanone	1.7E-02	4.6E-02	mg/kg	71SB11A	3/7	0.001 - 0.004	4.6E-02	--	4.7E+03	N	6.1E+04	N	IND	N	BSL
	108-10-1	4-Methyl-2-Pentanone	2.0E-03	1.6E-02	mg/kg	71SS12 DUP AVG	4/7	0.0006 - 0.002	1.6E-02	--	--	--	--	--	--	Y	NSV
	67-64-1	Acetone	2.4E-02	2.5E-01	mg/kg	71SB11A	7/7	0.001 - 0.003	2.5E-01	--	7.0E+03	N	9.2E+04	N	IND	N	BSL
	71-43-2	Benzene	1.0E-03	3.2E-03	mg/kg	71SS12 DUP AVG	2/7	0.0004 - 0.001	3.2E-03	--	1.2E+01	C	5.2E+01	C	IND	N	BSL
	74-83-9	Bromomethane	2.0E-03	2.0E-03	mg/kg	71SS13	1/7	0.001 - 0.003	2.0E-03	--	1.1E+01	N	1.4E+02	N	IND	N	BSL
	75-15-0	Carbon Disulfide	1.0E-03	1.4E-02	mg/kg	71SB11F	6/7	0.0005 - 0.002	1.4E-02	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	110-82-7	Cyclohexane	4.0E-03	4.0E-03	mg/kg	71SS12 DUP AVG	1/7	0.0005 - 0.001	4.0E-03	--	--	--	--	--	--	Y	NSV
	75-71-8	Dichlorodifluoromethane	1.0E-03	1.0E-03	mg/kg	71SB11A	1/7	0.0005 - 0.001	1.0E-03	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	100-41-4	Ethylbenzene	7.0E-04	5.0E-03	mg/kg	71SS12 DUP AVG	2/7	0.0004 - 0.001	5.0E-03	--	7.8E+02	N	1.0E+04	N	IND	N	BSL
	108-87-2	Methylcyclohexane	9.0E-04	2.7E-02	mg/kg	71SS12 DUP AVG	2/7	0.0005 - 0.001	2.7E-02	--	--	--	--	--	--	Y	NSV
	75-09-2	Methylene Chloride	1.0E-03	1.6E-02	mg/kg	71SS12 DUP AVG	4/7	0.0005 - 0.002	1.6E-02	--	8.5E+01	C	3.8E+02	C	IND	N	BSL
	100-42-5	Styrene	4.0E-04	1.0E-03	mg/kg	71SB11A	3/7	0.0003 - 0.0008	1.0E-03	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	108-88-3	Toluene	1.0E-03	1.3E-02	mg/kg	71SS12 DUP AVG	7/7	0.0004 - 0.001	1.3E-02	--	6.3E+02	N	8.2E+03	N	IND	N	BSL
	79-01-6	Trichloroethene	1.0E-03	2.1E-02	mg/kg	71SS12 DUP AVG	7/7	0.0004 - 0.001	2.1E-02	--	1.6E+00	C	7.2E+00	C	IND	N	BSL
	75-01-4	Vinyl Chloride	6.6E-02	6.6E-02	mg/kg	71SB11F	1/7	0.0005 - 0.001	6.6E-02	--	9.0E-02	C	4.0E+00	C	IND	N	BSL
	1330-20-7	Xylenes (Total)	2.0E-03	6.1E-02	mg/kg	71SS12 DUP AVG	7/7	0.001 - 0.004	6.1E-02	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
		TCL SVOCs															
	91-57-6	2-Methylnaphthalene	3.3E-02	7.8E-02	mg/kg	71SS13	3/7	0.024 - 0.024	7.8E-02	--	3.1E+01	N	4.1E+02	N	IND	N	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	4.7E-02	9.4E-02	mg/kg	71SB11F	6/7	0.032 - 0.032	9.4E-02	--	4.6E+01	C	2.0E+02	C	IND	N	BSL
	85-68-7	Butylbenzylphthalate	5.1E-02	5.1E-02	mg/kg	71SB11F	1/7	0.35 - 0.47	5.1E-02	--	1.6E+03	N	2.0E+04	N	IND	N	BSL
	117-84-0	Di-n-octylphthalate	1.4E-01	1.4E-01	mg/kg	71SB11F	1/7	0.35 - 0.47	1.4E-01	--	--	--	--	--	--	Y	NSV
		TCL PAHs															
	83-32-9	Acenaphthene	1.2E-01	1.4E-01	mg/kg	71SS13	2/7	0.0058 - 0.0059	1.4E-01	--	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene[6]	1.2E-01	3.6E-01	mg/kg	71SB11F	2/7	0.0059 - 0.0059	3.6E-01	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	2.6E-02	3.6E-02	mg/kg	71SS13	2/7	0.0022 - 0.0022	3.6E-02	--	2.2E-01	C	3.9E+00	C	IND	N	BSL
	50-32-8	Benzo(a)pyrene	5.4E-03	1.2E-01	mg/kg	71SB11F	3/7	0.0016 - 0.0016	1.2E-01	--	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	205-99-2	Benzo(b)fluoranthene	1.0E-02	5.6E-02	mg/kg	71SB11F	3/7	0.0017 - 0.0017	5.6E-02	--	2.2E-01	C	3.9E+00	C	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	7.9E-03	1.7E-02	mg/kg	71SS13	2/7	0.0014 - 0.0014	1.7E-02	--	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	9.0E-03	3.2E+00	mg/kg	71SB11F	3/7	0.0024 - 0.0024	3.2E+00	--	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	2.1E-01	2.1E-01	mg/kg	71SB11F	1/7	0.0042 - 0.0042	2.1E-01	--	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	206-44-0	Fluoranthene	3.1E-02	3.0E-01	mg/kg	71SB11F	5/7	0.0021 - 0.0021	3.0E-01	--	3.1E+02	N	4.1E+03	N	IND	N	BSL
	91-20-3	Naphthalene	4.4E-02	1.2E-01	mg/kg	71SS13	2/7	0.014 - 0.014	1.2E-01	--	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene[6]	6.7E-02	6.7E-02	mg/kg	71SS13	1/7	0.0085 - 0.0085	6.7E-02	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	2.2E-02	2.9E-01	mg/kg	71SB11F	2/7	0.0043 - 0.0043	2.9E-01	--	2.3E+02	N	3.1E+03	N	IND	N	BSL
		Dioxin/Furans															
		2,3,7,8-TCDD TEQ[7]	3.0E-06	6.2E-06	mg/kg	71SS11	3/3	--	6.2E-06	--	4.3E-06	C	1.9E-05	C	IND	Y	**ARES**
		DRO															
	--	DRO[8]	2.3E+00	4.6E+01	mg/kg	71SB13A	12/12	0.99 - 1.3	4.6E+01	--	--	--	1.0E+02	--	VDEQ	N	BSL

Table E.2-2.2
SWMU 71 COPC Determination - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RDA = Recommended Daily Allowance Based Screening Level
ARAR = Applicable, Relevant, and Appropriate Requirement
TBC = To-Be-Considered

RBC = USEPA Region III Risk-Based Concentration
(RBC) values from the October 11, 2007,
RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
C = Carcinogenic per EPA RBC Table (October 2007)
N = Noncarcinogenic per EPA RBC Table (October 2007)
IND = Adjusted Industrial RBC
VDEQ = Virginia Department of Environmental Qualtiy Screening Level

ARES = Above Residential RBC
***ARES/IND* =** Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Noncarcinogenic Industrial RBC value for Aroclor 1016 was used for screening
[5] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[6] = Pyrene RBC value was used
[7] = See Table 6-3 for 2,3,7,8-TCDD TEQ Calculations
[8] = VDEQ TPH Screening Level used

Table E.2-2.3
Non-detected Chemical MDL Screening for SWMU 71 - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
Gasoline Range Organics								
GRO	--	mg/kg	12	12	0.92	1.2	--	--
TAL Metals								
Antimony	7440-36-0	mg/kg	6	19	0.036	0.49	3.13	N
Cadmium	7440-43-9	mg/kg	1	19	0.03	0.03	3.91	N
Mercury[1]	7439-97-6	mg/kg	1	19	0.0048	0.0048	2.35	N
Selenium	7782-49-2	mg/kg	2	19	0.31	0.32	39.11	N
Silver	7440-22-4	mg/kg	4	19	0.08	0.09	39.11	N
Sodium	7440-23-5	mg/kg	8	19	19	19	--	NS
Thallium	7440-28-0	mg/kg	3	15	0.25	0.28	0.55	N
Pesticides/PCBs								
4,4'-DDD	72-54-8	ug/kg	4	4	0.32	0.32	2.7E+03	N
4,4'-DDE	72-55-9	ug/kg	4	4	0.4	0.4	1.9E+03	N
4,4'-DDT	50-29-3	ug/kg	4	4	0.39	0.39	1.9E+03	N
Aldrin	309-00-2	ug/kg	2	4	0.17	0.17	3.8E+01	N
alpha-BHC	319-84-6	ug/kg	4	4	0.26	0.26	1.0E+02	N
alpha-Chlordane[2]	5103-71-9	ug/kg	4	4	0.22	0.22	1.8E+03	N
beta-BHC	319-85-7	ug/kg	2	4	0.28	0.28	3.5E+02	N
delta-BHC[3]	319-86-8	ug/kg	4	4	0.15	0.15	1.0E+02	N
Dieldrin	60-57-1	ug/kg	4	4	0.43	0.43	4.0E+01	N
Endosulfan I	959-98-8	ug/kg	4	4	0.43	0.43	4.7E+04	N
Endosulfan II	33213-65-9	ug/kg	4	4	0.58	0.58	4.7E+04	N
Endosulfan Sulfate[4]	1031-07-8	ug/kg	4	4	0.4	0.4	4.7E+04	N
Endrin	72-20-8	ug/kg	4	4	0.35	0.35	2.3E+03	N
Endrin Aldehyde[5]	7421-93-4	ug/kg	4	4	0.35	0.35	2.3E+03	N
Endrin Ketone[5]	53494-70-5	ug/kg	4	4	0.39	0.39	2.3E+03	N
gamma-BHC (Lindane)	58-89-9	ug/kg	3	4	0.22	0.22	4.9E+02	N
gamma-Chlordane[2]	5103-74-2	ug/kg	4	4	0.35	0.35	1.8E+03	N
Heptachlor	76-44-8	ug/kg	4	4	0.34	0.34	1.4E+02	N
Heptachlor Epoxide	1024-57-3	ug/kg	4	4	0.26	0.26	7.0E+01	N
Methoxychlor	72-43-5	ug/kg	4	4	1.4	1.4	3.9E+04	N
Toxaphene	8001-35-2	ug/kg	4	4	18	18	5.8E+02	N
Aroclor 1016	12674-11-2	ug/kg	18	19	5.1	15	5.5E+02	N
Aroclor 1221	11104-28-2	ug/kg	19	19	14	19	3.2E+02	N
Aroclor 1232	11141-16-5	ug/kg	19	19	5.3	6.9	3.2E+02	N
Aroclor 1242	53469-21-9	ug/kg	19	19	7.3	10	3.2E+02	N
Aroclor 1248	12672-29-6	ug/kg	18	19	4.4	9.1	3.2E+02	N
Aroclor 1254[6]	11097-69-1	ug/kg	10	19	8	9.2	1.6E+02	N
Aroclor 1260	11096-82-5	ug/kg	16	19	5.2	9.2	3.2E+02	N
TCL VOCs								
1,1,1-Trichloroethane	71-55-6	ug/kg	7	7	0.5	2	1.6E+07	N
1,1,2,2-Tetrachloroethane	79-34-5	ug/kg	7	7	0.2	0.5	3.2E+03	N
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/kg	7	7	6	18	2.3E+08	N
1,1,2-Trichloroethane	79-00-5	ug/kg	7	7	0.2	0.5	1.1E+04	N
1,1-Dichloroethane	75-34-3	ug/kg	7	7	0.3	1	1.6E+06	N
1,1-Dichloroethene	75-35-4	ug/kg	7	7	0.7	2	3.9E+05	N
1,2,4-Trichlorobenzene	120-82-1	ug/kg	7	7	0.4	1	7.8E+04	N
1,2-Dibromo-3-chloropropane	96-12-8	ug/kg	7	7	0.3	0.8	2.0E+02	N
1,2-Dibromoethane	106-93-4	ug/kg	7	7	0.2	0.6	3.2E+02	N
1,2-Dichlorobenzene	95-50-1	ug/kg	7	7	0.2	0.5	7.0E+05	N
1,2-Dichloroethane	107-06-2	ug/kg	7	7	0.3	1	7.0E+03	N
1,2-Dichloropropane	78-87-5	ug/kg	7	7	0.2	0.6	9.4E+03	N
1,3-Dichlorobenzene	541-73-1	ug/kg	7	7	0.3	0.8	2.3E+04	N
1,4-Dichlorobenzene	106-46-7	ug/kg	7	7	0.3	0.7	2.7E+04	N
2-Butanone	78-93-3	ug/kg	4	7	1	2	4.7E+06	N
2-Hexanone	591-78-6	ug/kg	7	7	0.6	2	--	NS
4-Methyl-2-Pentanone	108-10-1	ug/kg	3	7	0.6	0.8	--	NS
Benzene	71-43-2	ug/kg	5	7	0.4	0.6	1.2E+04	N
Bromodichloromethane	75-27-4	ug/kg	7	7	0.2	0.6	1.0E+04	N
Bromoform	75-25-2	ug/kg	7	7	0.3	0.8	8.1E+04	N
Bromomethane	74-83-9	ug/kg	6	7	1	3	1.1E+04	N
Carbon Disulfide	75-15-0	ug/kg	1	7	0.6	0.6	7.8E+05	N
Carbon Tetrachloride	56-23-5	ug/kg	7	7	0.5	2	4.9E+03	N
Chlorobenzene	108-90-7	ug/kg	7	7	0.3	0.7	1.6E+05	N

Table E.2-2.3
Non-detected Chemical MDL Screening for SWMU 71 - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
Chloroethane	75-00-3	ug/kg	7	7	0.5	1	2.2E+05	N
Chloroform	67-66-3	ug/kg	7	7	0.4	1	7.8E+04	N
Chloromethane	74-87-3	ug/kg	7	7	1	3	--	NS
cis-1,2-Dichloroethene	156-59-2	ug/kg	7	7	0.4	1	7.8E+04	N
cis-1,3-Dichloropropene	10061-01-5	ug/kg	7	7	0.3	0.9	6.4E+03	N
Cyclohexane	110-82-7	ug/kg	6	7	0.5	1	--	NS
Dibromochloromethane	124-48-1	ug/kg	7	7	0.2	0.5	7.6E+03	N
Dichlorodifluoromethane	75-71-8	ug/kg	6	7	0.5	1	1.6E+06	N
Ethylbenzene	100-41-4	ug/kg	5	7	0.4	0.8	7.8E+05	N
Isopropylbenzene	98-82-8	ug/kg	7	7	6	18	7.8E+05	N
Methyl Acetate	79-20-9	ug/kg	7	7	0.6	2	7.8E+06	N
Methyl-t-butyl Ether	1634-04-4	ug/kg	7	7	6	18	1.6E+05	N
Methylcyclohexane	108-87-2	ug/kg	5	7	0.5	0.9	--	NS
Methylene Chloride	75-09-2	ug/kg	3	7	0.5	0.7	8.5E+04	N
Styrene	100-42-5	ug/kg	4	7	0.3	0.8	1.6E+06	N
Tetrachloroethene	127-18-4	ug/kg	7	7	0.4	1	1.2E+03	N
trans-1,2-Dichloroethene	156-60-5	ug/kg	7	7	0.4	1	1.6E+05	N
trans-1,3-Dichloropropene	10061-02-6	ug/kg	7	7	0.2	0.7	6.4E+03	N
Trichlorofluoromethane	75-69-4	ug/kg	7	7	0.6	2	2.3E+06	N
Vinyl Chloride	75-01-4	ug/kg	6	7	0.5	1	9.0E+01	N
TCL SVOCs								
1,1'-Biphenyl	92-52-4	ug/kg	7	7	22	22	3.9E+05	N
2,2'-oxybis(1-chloropropane)	108-60-1	ug/kg	7	7	30	30	9.1E+03	N
2,4,5-Trichlorophenol	95-95-4	ug/kg	7	7	49	49	7.8E+05	N
2,4,6-Trichlorophenol[7]	88-06-2	ug/kg	7	7	50	50	7.8E+03	N
2,4-Dichlorophenol	120-83-2	ug/kg	7	7	22	22	2.3E+04	N
2,4-Dimethylphenol	105-67-9	ug/kg	7	7	30	30	1.6E+05	N
2,4-Dinitrophenol	51-28-5	ug/kg	7	7	170	170	1.6E+04	N
2,4-Dinitrotoluene	121-14-2	ug/kg	7	7	20	20	1.6E+04	N
2,6-Dinitrotoluene	606-20-2	ug/kg	7	7	21	21	7.8E+03	N
2-Chloronaphthalene	91-58-7	ug/kg	7	7	22	22	6.3E+05	N
2-Chlorophenol	95-57-8	ug/kg	7	7	18	18	3.9E+04	N
2-Methylnaphthalene	91-57-6	ug/kg	4	7	24	24	3.1E+04	N
2-Methylphenol	95-48-7	ug/kg	7	7	27	27	3.9E+05	N
2-Nitroaniline	88-74-4	ug/kg	7	7	29	29	--	NS
2-Nitrophenol	88-75-5	ug/kg	7	7	26	26	--	NS
3,3'-Dichlorobenzidine	91-94-1	ug/kg	7	7	29	29	1.4E+03	N
3-Nitroaniline	99-09-2	ug/kg	7	7	34	34	--	NS
4,6-Dinitro-2-Methylphenol	534-52-1	ug/kg	7	7	35	35	--	NS
4-Bromophenyl Phenyl Ether	101-55-3	ug/kg	7	7	350	470	--	NS
4-Chloro-3-Methylphenol	59-50-7	ug/kg	7	7	29	29	--	NS
4-Chloroaniline	106-47-8	ug/kg	7	7	16	16	3.1E+04	N
4-Chlorophenyl Phenyl Ether	7005-72-3	ug/kg	7	7	350	470	--	NS
4-Methylphenol	106-44-5	ug/kg	7	7	48	48	3.9E+04	N
4-Nitroaniline	100-01-6	ug/kg	7	7	39	39	--	NS
4-Nitrophenol	100-02-7	ug/kg	7	7	75	75	--	NS
Acenaphthene	83-32-9	ug/kg	7	7	31	31	4.7E+05	N
Acenaphthylene[8]	208-96-8	ug/kg	6	7	17	17	2.3E+05	N
Acetophenone	98-86-2	ug/kg	7	7	23	23	7.8E+05	N
Anthracene	120-12-7	ug/kg	7	7	25	25	2.3E+06	N
Atrazine	1912-24-9	ug/kg	7	7	16	16	2.9E+03	N
Benzaldehyde	100-52-7	ug/kg	7	7	39	39	7.8E+05	N
Benzo(a)anthracene	50-32-8	ug/kg	7	7	29	29	2.2E+01	**Y**
Benzo(a)pyrene	56-55-3	ug/kg	6	7	23	23	2.2E+02	N
Benzo(b)fluoranthene	205-99-2	ug/kg	6	7	36	36	2.2E+02	N
Benzo(g,h,i)perylene[8]	191-24-2	ug/kg	6	7	23	23	2.3E+05	N
Benzo(k)fluoranthene	207-08-9	ug/kg	6	7	29	29	2.2E+03	N
bis(2-Chloroethoxy)methane	111-91-1	ug/kg	7	7	21	21	--	NS
bis(2-Chloroethyl)ether	111-44-4	ug/kg	7	7	18	18	5.8E+02	N
bis(2-ethylhexyl)phthalate	117-81-7	ug/kg	1	7	32	32	4.6E+04	N
Butylbenzylphthalate	85-68-7	ug/kg	6	7	350	470	1.6E+06	N
Caprolactam	105-60-2	ug/kg	7	7	62	62	3.9E+06	N
Carbazole	86-74-8	ug/kg	7	7	29	29	3.2E+04	N
Chrysene	218-01-9	ug/kg	6	7	28	28	2.2E+04	N
Di-n-butylphthalate	84-74-2	ug/kg	7	7	350	470	7.8E+05	N

Table E.2-2.3
Non-detected Chemical MDL Screening for SWMU 71 - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
Di-n-octylphthalate	117-84-0	ug/kg	6	7	350	470	--	NS
Dibenzo(a,h)anthracene	53-70-3	ug/kg	6	7	21	21	2.2E+01	N
Dibenzofuran	132-64-9	ug/kg	7	7	24	24	7.8E+03	N
Diethylphthalate	84-66-2	ug/kg	7	7	350	470	6.3E+06	N
Dimethylphthalate	131-11-3	ug/kg	7	7	350	470	--	NS
Fluoranthene	206-44-0	ug/kg	3	7	18	18	3.1E+05	N
Fluorene	86-73-7	ug/kg	7	7	18	18	3.1E+05	N
Hexachlorobenzene	118-74-1	ug/kg	7	7	22	22	4.0E+02	N
Hexachlorobutadiene[9]	87-68-3	ug/kg	7	7	24	24	7.8E+03	N
Hexachlorocyclopentadiene	77-47-4	ug/kg	7	7	67	67	4.7E+04	N
Hexachloroethane[10]	67-72-1	ug/kg	7	7	17	17	7.8E+03	N
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	6	7	20	20	2.2E+02	N
Isophorone	78-59-1	ug/kg	7	7	28	28	6.7E+05	N
n-Nitroso-di-n-Propylamine	621-64-7	ug/kg	7	7	21	21	9.1E+01	N
n-Nitrosodiphenylamine	86-30-6	ug/kg	7	7	350	770	1.3E+05	N
Naphthalene	91-20-3	ug/kg	6	7	21	21	1.6E+05	N
Nitrobenzene	98-95-3	ug/kg	7	7	28	28	3.9E+03	N
Pentachlorophenol	87-86-5	ug/kg	7	7	46	46	5.3E+03	N
Phenanthrene[8]	85-01-8	ug/kg	4	7	24	24	2.3E+05	N
Phenol	108-95-2	ug/kg	7	7	34	34	2.3E+06	N
Pyrene	129-00-0	ug/kg	4	7	24	24	2.3E+05	N
Dioxin/Furans								
1,2,3,4,7,8,9-HpCDF	55673-89-7	pg/g	3	3	0.4	2	--	NS
1,2,3,4,7,8-HxCDD	39227-28-6	pg/g	1	3	1.3	1.3	--	NS
1,2,3,6,7,8-HxCDF	57117-44-9	pg/g	1	3	0.3	0.3	--	NS
1,2,3,7,8,9-HxCDF	72918-21-9	pg/g	3	3	0.2	1	--	NS
1,2,3,7,8-PeCDD	40321-76-4	pg/g	1	3	0.6	0.6	--	NS
1,2,3,7,8-PeCDF	57117-41-6	pg/g	2	3	0.1	0.4	--	NS
2,3,7,8-TCDD	1746-01-6	pg/g	1	3	0.3	0.3	4.3E+00	N
Total PeCDD	36088-22-9	pg/g	1	3	0.6	0.6	--	NS
PAHs								
Acenaphthene	83-32-9	ug/kg	5	7	5.8	5.9	4.7E+05	N
Acenaphthylene[8]	208-96-8	ug/kg	5	7	5.9	5.9	2.3E+05	N
Anthracene	120-12-7	ug/kg	7	7	5.4	5.4	2.3E+06	N
Benzo(a)anthracene	50-32-8	ug/kg	5	7	2.2	2.2	2.2E+01	N
Benzo(a)pyrene	56-55-3	ug/kg	4	7	1.6	1.6	2.2E+02	N
Benzo(b)fluoranthene	205-99-2	ug/kg	4	7	1.7	1.7	2.2E+02	N
Benzo(g,h,i)perylene[8]	207-08-9	ug/kg	7	7	3.6	3.6	2.2E+03	N
Benzo(k)fluoranthene	191-24-2	ug/kg	5	7	1.4	1.4	2.3E+05	N
Chrysene	218-01-9	ug/kg	4	7	2.4	2.4	2.2E+04	N
Dibenzo(a,h)anthracene	53-70-3	ug/kg	6	7	4.2	4.2	2.2E+01	N
Fluoranthene	206-44-0	ug/kg	2	7	2.1	2.1	3.1E+05	N
Fluorene	86-73-7	ug/kg	7	7	14	14	3.1E+05	N
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	7	7	2.5	2.5	2.2E+02	N
Naphthalene	91-20-3	ug/kg	5	7	14	14	1.6E+05	N
Phenanthrene[8]	85-01-8	ug/kg	6	7	8.5	8.5	2.3E+05	N
Pyrene	129-00-0	ug/kg	5	7	4.3	4.3	2.3E+05	N
Explosives								
1,3,5-Trinitrobenzene	99-35-4	mg/kg	7	7	0.079	0.079	2.3E+02	N
1,3-Dinitrobenzene	99-65-0	mg/kg	7	7	0.097	0.097	7.8E-01	N
2,4,6-Trinitrotoluene[11]	118-96-7	mg/kg	7	7	0.16	0.16	3.9E+00	N
2,4-Dinitrotoluene	121-14-2	mg/kg	7	7	0.12	0.12	1.6E+01	N
2,6-Dinitrotoluene	606-20-2	mg/kg	7	7	0.19	0.19	7.8E+00	N
2-Amino-4,6-Dinitrotoluene	35572-78-2	mg/kg	7	7	0.1	0.1	1.6E+01	N
2-Nitrotoluene	88-72-2	mg/kg	7	7	0.16	0.16	7.8E+01	N
3-Nitrotoluene	99-08-1	mg/kg	7	7	0.11	0.11	--	NS
4-Amino-2,6-Dinitrotoluene	1946-51-0	mg/kg	7	7	0.095	0.095	1.6E+01	N
4-Nitrotoluene[12]	99-99-0	mg/kg	7	7	0.27	0.27	3.1E+01	N
HMX	2691-41-0	mg/kg	7	7	0.1	0.1	3.9E+02	N
Nitrobenzene	98-95-3	mg/kg	7	7	0.17	0.17	3.9E+00	N
RDX	121-82-4	mg/kg	7	7	0.28	0.28	5.8E+00	N
Tetryl	479-45-8	mg/kg	7	7	0.4	0.4	3.1E+01	N

Table E.2-2.3
Non-detected Chemical MDL Screening for SWMU 71 - Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
Nitroglycerin								
Nitroglycerin	55-63-0	mg/kg	7	7	1	1	7.8E-01	**Y**

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
R-RBC = Residential RBC

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available
SL = Screening Level

[1] = Mercuric chloride soil RBC value used
[2] = Chlordane RBC value was used
[3] = Alpha-BHC RBC value was used
[4] = Endosulfan RBC value was used
[5] = Endrin RBC value was used
[6] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[7] = Noncarcinogenic RBC value for 2,4,6-Trichlorophenol was used
[8] = Noncarcinogenic RBC value for Hexachlorobutadiene was used
[9] = Noncarcinogenic RBC value for Hexachloroethane was used
[10] = Pyrene RBC value was used
[11] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening
[12] = Noncarcinogenic RBC value for 4-Nitrotoluene was used

Table E.2-2.4
SWMU 71 Groundwater COPC Selection
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter	CAS #	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	C/N	Adjusted Tap Water RBC	Potential ARAR/TBC	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Perchlorate (ug/L)														
Perchlorate	14797-73-0	0.52	0.655	µg/L	40MW5 DUP AVG	3/3	0.08 - 0.08	0.655	N	2.56	--	--	N	BSL
TAL Metals (ug/L)														
Antimony, Total	7440-36-0	0.43	0.43	µg/L	40MW5 DUP AVG	1/3	0.44 - 0.44	0.43	N	1.46	--	--	N	BSL
Barium, Dissolved	7440-39-3	29	46	µg/L	40MW5 DUP AVG	3/3	0.52 - 0.52	46	N	730	2,000	MCL	N	BSL
Barium, Total	7440-39-3	29	43.5	µg/L	40MW5 DUP AVG	3/3	0.52 - 0.52	43.5	N	730	2,000	MCL	N	BSL
Calcium, Dissolved	7440-70-2	53,000	70,000	µg/L	40MW5 DUP AVG	3/3	40 - 200	70,000	--	--	220,000	RDA	N	BSL
Calcium, Total	7440-70-2	52,000	71,000	µg/L	40MW6	3/3	40 - 40	71,000	--	--	220,000	RDA	N	BSL
Chromium, Dissolved [1]	7440-47-3	1.2	1.6	µg/L	40MW5 DUP AVG	3/3	0.31 - 0.31	1.6	N	10.95	100	MCL	N	BSL
Chromium, Total [1]	7440-47-3	1.365	5	µg/L	40MW6	3/3	0.31 - 0.31	5	N	10.95	100	MCL	N	BSL
Cobalt, Dissolved	7440-48-4	0.3	0.45	µg/L	40MW5 DUP AVG	3/3	0.096 - 0.096	0.45	--	--	--	--	Y	NSV
Cobalt, Total	7440-48-4	0.125	0.3	µg/L	40MW6	3/3	0.096 - 0.096	0.3	--	--	--	--	Y	NSV
Copper, Dissolved	7440-50-8	0.86	0.91	µg/L	40MW6	3/3	0.33 - 0.33	0.91	N	146	1,300	MCL	N	BSL
Copper, Total	7440-50-8	0.79	1.3	µg/L	40MW3	3/3	0.33 - 0.33	1.3	N	146	1,300	MCL	N	BSL
Iron, Dissolved	7439-89-6	9.85	17	µg/L	40MW3	3/3	5.7 - 5.7	17	N	2,555	--	--	N	BSL
Iron, Total	7439-89-6	12.5	28	µg/L	40MW6	3/3	5.7 - 5.7	28	N	2,555	--	--	N	BSL
Lead, Total [2]	7439-92-1	0.51	0.51	µg/L	40MW3	1/3	0.33 - 0.33	0.51	--	15	--	--	N	BSL
Manganese, Dissolved	7439-96-5	0.4825	0.4825	µg/L	40MW5 DUP AVG	1/3	0.43 - 0.43	0.4825	N	73	--	--	N	BSL
Manganese, Total	7439-96-5	0.48	0.48	µg/L	40MW3	1/3	0.43 - 0.43	0.48	N	73	--	--	N	BSL
Magnesium, Dissolved	7439-95-4	18,000	22,000	µg/L	40MW5 DUP AVG	3/3	38 - 38	22,000	--	--	31,000	RDA	N	BSL
Magnesium, Total	7439-95-4	18,000	22,000	µg/L	40MW6	3/3	38 - 38	22,000	--	--	31,000	RDA	N	BSL
Mercury, Total [3]	7439-97-6	0.04	0.04	µg/L	40MW3	1/3	0.039 - 0.039	0.04	N	0.37	2	MCL	N	BSL
Nickel, Dissolved	7440-02-0	1.145	1.8	µg/L	40MW6	3/3	0.28 - 0.28	1.8	N	73	--	--	N	BSL
Nickel, Total	7440-02-0	0.935	2.1	µg/L	40MW6	3/3	0.28 - 0.28	2.1	N	73	--	--	N	BSL
Potassium, Dissolved	7440-09-7	1,000	1,200	µg/L	40MW3	3/3	54 - 54	1,200	--	--	520,000	RDA	N	BSL
Potassium, Total	7440-09-7	1,000	1,200	µg/L	40MW3	3/3	54 - 54	1,200	--	--	520,000	RDA	N	BSL
Selenium, Dissolved	7782-49-2	1.1	1.3	µg/L	40MW3	2/3	0.92 - 0.92	1.3	N	18.25	50	MCL	N	BSL
Selenium, Total	7782-49-2	0.93	0.93	µg/L	40MW5 DUP AVG	1/3	0.92 - 0.92	0.93	N	18.25	50	MCL	N	BSL
Sodium, Dissolved	7440-23-5	6,850	7,800	µg/L	40MW3	3/3	84 - 84	7,800	--	--	130,000	RDA	N	BSL
Sodium, Total	7440-23-5	6,950	7,600	µg/L	40MW3	3/3	84 - 84	7,600	--	--	130,000	RDA	N	BSL
Vanadium, Dissolved	7440-62-2	1.1575	1.1575	µg/L	40MW5 DUP AVG	1/3	0.83 - 0.83	1.1575	N	3.65	--	--	N	BSL
Zinc, Dissolved	7440-66-6	3.1	4.7	µg/L	40MW6	3/3	0.84 - 0.84	4.7	N	1,095	--	--	N	BSL
Zinc, Total	7440-66-6	10.5	15	µg/L	40MW3	3/3	0.84 - 0.84	15	N	1,095	--	--	N	BSL
Pesticides (ug/L)														
gamma-BHC (Lindane)	58-89-9	0.0098	0.0098	µg/L	40MW6	1/3	0.0018 - 0.0018	0.0098	C	0.0515	--	--	N	BSL
TCL VOCs (ug/L)														
Acetone	67-64-1	1.6	1.6	µg/L	40MW6	1/3	1.2 - 1.2	1.6	N	547.5	--	--	N	BSL
Chloroform	67-66-3	19	24	µg/L	40MW6	3/3	0.061 - 0.061	24	C	0.155	80	MCL	Y	**ARBC**
Toluene	108-88-3	0.09	0.09	µg/L	40MW5 DUP AVG	1/3	0.072 - 0.072	0.09	N	227.1	--	--	N	BSL
TCL SVOCs (ug/L)														
1,1'-Biphenyl	92-52-4	0.033	0.033	µg/L	40MW5 DUP AVG	1/3	0.015 - 0.015	0.033	N	30.42	--	--	N	BSL
2-Methylnaphthalene	91-57-6	0.102	0.102	µg/L	40MW5 DUP AVG	1/3	0.015 - 0.015	0.102	N	2.43	--	--	N	BSL
Butylbenzylphthalate	85-68-7	0.038	0.057	µg/L	40MW3	2/3	0.029 - 0.029	0.057	N	730	--	--	N	BSL
Diethylphthalate	84-66-2	0.0275	0.038	µg/L	40MW3	2/3	0.034 - 0.034	0.038	N	2920	--	--	N	BSL
Naphthalene	91-20-3	0.097	0.097	µg/L	40MW5 DUP AVG	1/3	0.023 - 0.023	0.097	N	0.651	--	--	N	BSL

Notes:

CAS = Chemical Abstracts Service
µg/L = Microgram Per Liter
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
ARAR = Applicable, Relevant, and Appropriate Requirement
TBC = To-Be-Considered

C = Carcinogenic per EPA RBC Table (October 2007)
N = Noncarcinogenic per EPA RBC Table (October 2007)
[1] = RBC for Chromium VI used for sceening
[2] = USEPA Drinking Water Action Level used for screening
[3] = RBC for Methylmercury used for screeening
MCL = Maximum Contaminant Level
BSL = Below Tap Water RBC/MCL
DUP AVG = results for duplicate samples averaged
ARBC = Above Tap Water RBC

Table E.2-2.5
SWMU 71 Groundwater Non-detects Screening
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adj. Tap Water RBC	Maximum MDL Exceeds SL
TAL Metals								
Aluminum, Dissolved	7429-90-5	ug/L	3	3	44	44	3,650	N
Aluminum, Total	7429-90-5	ug/L	3	3	44	44	3,650	N
Antimony, Dissolved	7440-36-0	ug/L	3	3	0.44	0.44	1.46	N
Antimony, Total	7440-36-0	ug/L	2	3	0.44	0.44	1.46	N
Arsenic, Dissolved	7440-38-2	ug/L	3	3	0.74	0.74	0.045	**Y**
Arsenic, Total	7440-38-2	ug/L	3	3	0.74	0.74	0.045	**Y**
Beryllium, Dissolved	7440-41-7	ug/L	3	3	0.31	0.31	7.3	N
Beryllium, Total	7440-41-7	ug/L	3	3	0.31	0.31	7.3	N
Cadmium, Dissolved	7440-43-9	ug/L	3	3	0.062	0.062	1.825	N
Cadmium, Total	7440-43-9	ug/L	3	3	0.062	0.062	1.825	N
Lead, Dissolved[1]	7439-92-1	ug/L	3	3	0.33	0.33	15	N
Lead, Total[1]	7439-92-1	ug/L	2	3	0.33	0.33	15	N
Manganese, Dissolved	7439-96-5	ug/L	2	3	0.43	0.43	73	N
Manganese, Total	7439-96-5	ug/L	2	3	0.43	0.43	73	N
Mercury, Dissolved[2]	7439-97-6	ug/L	3	3	0.039	0.039	0.37	N
Mercury, Total[2]	7439-97-6	ug/L	2	3	0.039	0.039	0.37	N
Selenium, Dissolved	7782-49-2	ug/L	1	3	0.92	0.92	18.25	N
Selenium, Total	7782-49-2	ug/L	2	3	0.92	0.92	18.25	N
Silver, Dissolved	7440-22-4	ug/L	3	3	0.12	0.12	18.25	N
Silver, Total	7440-22-4	ug/L	3	3	0.12	0.12	18.25	N
Thallium, Dissolved	7440-28-0	ug/L	3	3	0.17	0.17	0.256	N
Thallium, Total	7440-28-0	ug/L	3	3	0.17	0.17	0.256	N
Vanadium, Dissolved	7440-62-2	ug/L	2	3	0.83	0.83	3.65	N
Vanadium, Total	7440-62-2	ug/L	3	3	0.83	0.83	3.65	N
Pesticides/PCBs								
4,4'-DDD	72-54-8	ug/L	3	3	0.0019	0.0019	0.279	N
4,4'-DDE	72-55-9	ug/L	3	3	0.0027	0.0027	0.197	N
4,4'-DDT	50-29-3	ug/L	3	3	0.002	0.002	0.197	N
Aldrin	309-00-2	ug/L	3	3	0.0079	0.0079	0.004	**Y**
alpha-BHC	319-84-6	ug/L	3	3	0.0019	0.0019	0.011	N
alpha-Chlordane	5103-71-9	ug/L	3	3	0.0021	0.0021	0.191	N
beta-BHC	319-85-7	ug/L	3	3	0.0032	0.0032	0.037	N
delta-BHC	319-86-8	ug/L	3	3	0.0023	0.0023	0.011	N
Dieldrin	60-57-1	ug/L	3	3	0.002	0.002	0.0042	N
Endosulfan I	959-98-8	ug/L	3	3	0.0023	0.0023	21.9	N
Endosulfan II	33213-65-9	ug/L	3	3	0.0018	0.0018	21.9	N
Endosulfan Sulfate	1031-07-8	ug/L	3	3	0.0033	0.0033	21.9	N
Endrin	72-20-8	ug/L	3	3	0.002	0.002	1.095	N
Endrin Aldehyde	7421-93-4	ug/L	3	3	0.0029	0.0029	1.095	N
Endrin Ketone	53494-70-5	ug/L	3	3	0.0033	0.0033	1.095	N
gamma-BHC (Lindane)	58-89-9	ug/L	2	3	0.0018	0.0018	0.052	N
gamma-Chlordane	5103-74-2	ug/L	3	3	0.0021	0.0021	0.191	N
Heptachlor	76-44-8	ug/L	3	3	0.003	0.003	0.015	N
Heptachlor Epoxide	1024-57-3	ug/L	3	3	0.0021	0.0021	0.007	N
Methoxychlor	72-43-5	ug/L	3	3	0.0052	0.0052	18.25	N
Toxaphene	8001-35-2	ug/L	3	3	0.1	0.1	0.061	**Y**
Aroclor 1016[3]	12674-11-2	ug/L	3	3	0.05	0.05	0.255	N
Aroclor 1221	11104-28-2	ug/L	3	3	0.068	0.068	0.033	**Y**
Aroclor 1232	11141-16-5	ug/L	3	3	0.031	0.031	0.033	N
Aroclor 1242	53469-21-9	ug/L	3	3	0.035	0.035	0.033	**Y**
Aroclor 1248	12672-29-6	ug/L	3	3	0.04	0.04	0.033	**Y**
Aroclor 1254	11097-69-1	ug/L	3	3	0.034	0.034	0.033	**Y**
Aroclor 1260	11096-82-5	ug/L	3	3	0.034	0.034	0.033	**Y**
Aroclor 1262	37324-23-5	ug/L	3	3	0.022	0.022	--	NS
Aroclor 1268	11100-14-4	ug/L	3	3	0.049	0.049	--	NS
TCL VOCs								
1,1,1-Trichloroethane	71-55-6	ug/L	3	3	0.11	0.11	913.3	N
1,1,2,2-Tetrachloroethane	79-34-5	ug/L	3	3	0.1	0.1	0.053	**Y**
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/L	3	3	0.14	0.14	5,938	N
1,1,2-Trichloroethane	79-00-5	ug/L	3	3	0.21	0.21	0.188	**Y**
1,1-Dichloroethane	75-34-3	ug/L	3	3	0.076	0.076	89.6	N
1,1-Dichloroethene	75-35-4	ug/L	3	3	0.14	0.14	35.3	N
1,2,3-Trichlorobenzene	87-61-6	ug/L	3	3	0.13	0.13	--	NS
1,2,4-Trichlorobenzene	120-82-1	ug/L	3	3	0.16	0.16	6.08	N
1,2-Dibromo-3-chloropropane	96-12-8	ug/L	3	3	0.29	0.29	0.0002	**Y**
1,2-Dibromoethane	106-93-4	ug/L	3	3	0.22	0.22	0.0053	**Y**
1,2-Dichlorobenzene	95-50-1	ug/L	3	3	0.065	0.065	26.8	N
1,2-Dichloroethane	107-06-2	ug/L	3	3	0.15	0.15	0.116	**Y**
1,2-Dichloropropane	78-87-5	ug/L	3	3	0.1	0.1	0.257	N
1,3-Dichlorobenzene	541-73-1	ug/L	3	3	0.12	0.12	1.825	N
1,4-Dichlorobenzene	106-46-7	ug/L	3	3	0.13	0.13	0.281	N

Table E.2-2.5
SWMU 71 Groundwater Non-detects Screening
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adj. Tap Water RBC	Maximum MDL Exceeds SL
2-Butanone	78-93-3	ug/L	3	3	0.33	0.33	696.8	N
2-Hexanone	591-78-6	ug/L	3	3	0.42	0.42	--	NS
4-Methyl-2-pentanone	108-10-1	ug/L	3	3	0.38	0.38	627.8	N
Acetone	67-64-1	ug/L	2	3	1.2	1.2	547.5	N
Benzene	71-43-2	ug/L	3	3	0.12	0.12	0.336	N
Bromochloromethane	74-97-5	ug/L	3	3	0.2	0.2	--	NS
Bromodichloromethane	75-27-4	ug/L	3	3	0.19	0.19	0.17	**Y**
Bromoform	75-25-2	ug/L	3	3	0.23	0.23	8.48	N
Bromomethane	74-83-9	ug/L	3	3	0.19	0.19	0.852	N
Carbon Disulfide	75-15-0	ug/L	3	3	0.28	0.28	104.3	N
Carbon Tetrachloride	56-23-5	ug/L	3	3	0.15	0.15	0.162	N
Chlorobenzene	108-90-7	ug/L	3	3	0.12	0.12	8.96	N
Chloroethane	75-00-3	ug/L	3	3	0.2	0.2	3.64	N
Chloroform	67-66-3	ug/L	0	3	0	0	0.155	N
Chloromethane	74-87-3	ug/L	3	3	0.06	0.06	18.98	N
cis-1,2-Dichloroethene	156-59-2	ug/L	3	3	0.17	0.17	6.083	N
cis-1,3-Dichloropropene	10061-01-5	ug/L	3	3	0.14	0.14	0.436	N
Cyclohexane	110-82-7	ug/L	3	3	0.14	0.14	1241	N
Dibromochloromethane	124-48-1	ug/L	3	3	0.14	0.14	0.126	**Y**
Dichlorodifluoromethane	75-71-8	ug/L	3	3	0.17	0.17	34.76	N
Ethylbenzene	100-41-4	ug/L	3	3	0.13	0.13	133.99	N
Isopropylbenzene	98-82-8	ug/L	3	3	0.12	0.12	65.82	N
Methyl Acetate	79-20-9	ug/L	3	3	0.16	0.16	608.3	N
Methyl tert-Butyl Ether	1634-04-4	ug/L	3	3	0.096	0.096	2.64	N
Methylcyclohexane	108-87-2	ug/L	3	3	0.15	0.15	627.8	N
Methylene Chloride	75-09-2	ug/L	3	3	0.051	0.051	4.10	N
Styrene	100-42-5	ug/L	3	3	0.11	0.11	162.3	N
Tetrachloroethene	127-18-4	ug/L	3	3	0.15	0.15	0.104	**Y**
Toluene	108-88-3	ug/L	2	3	0.072	0.072	227.1	N
trans-1,2-Dichloroethene	156-60-5	ug/L	3	3	0.16	0.16	10.61	N
trans-1,3-Dichloropropene	10061-02-6	ug/L	3	3	0.16	0.16	0.436	N
Trichloroethene	79-01-6	ug/L	3	3	0.17	0.17	0.026	**Y**
Trichlorofluoromethane	75-69-4	ug/L	3	3	0.18	0.18	128.8	N
Vinyl Chloride	75-01-4	ug/L	3	3	0.17	0.17	0.015	**Y**
Xylenes (Total)	1330-20-7	ug/L	3	3	0.36	0.36	21.26	N
TCL SVOCs								
1,1'-Biphenyl	92-52-4	ug/L	2	3	0.015	0.015	30.42	N
1,2,4,5-Tetrachlorobenzene	95-94-3	ug/L	3	3	0.024	0.024	1.095	N
2,3,4,6-Tetrachlorophenol	58-90-2	ug/L	3	3	0.16	0.16	109.5	N
2,4,5-Trichlorophenol	95-95-4	ug/L	3	3	0.11	0.11	365	N
2,4,6-Trichlorophenol [4]	88-06-2	ug/L	3	3	0.027	0.027	3.6	N
2,4-Dichlorophenol	120-83-2	ug/L	3	3	0.015	0.015	10.95	N
2,4-Dimethylphenol	105-67-9	ug/L	3	3	0.33	0.33	73	N
2,4-Dinitrophenol	51-28-5	ug/L	3	3	1.5	1.5	7.3	N
2,4-Dinitrotoluene	121-14-2	ug/L	3	3	0.21	0.21	7.3	N
2,6-Dinitrotoluene	606-20-2	ug/L	3	3	0.05	0.05	3.65	N
2-Chloronaphthalene	91-58-7	ug/L	3	3	0.012	0.012	48.67	N
2-Chlorophenol	95-57-8	ug/L	3	3	0.016	0.016	3.042	N
2-Methylnaphthalene	91-57-6	ug/L	2	3	0.015	0.015	2.433	N
2-Methylphenol	95-48-7	ug/L	3	3	0.14	0.14	182.5	N
2-Nitroaniline	88-74-4	ug/L	3	3	0.12	0.12	--	NS
2-Nitrophenol	88-75-5	ug/L	3	3	0.026	0.026	--	NS
3,3'-Dichlorobenzidine	91-94-1	ug/L	3	3	0.21	0.21	0.149	**Y**
3-Nitroaniline	99-09-2	ug/L	3	3	0.13	0.13	--	NS
4,6-Dinitro-2-methylphenol	534-52-1	ug/L	3	3	0.12	0.12	--	NS
4-Bromophenyl-PhenylEther	101-55-3	ug/L	3	3	0.026	0.026	--	NS
4-Chloro-3-methylphenol	59-50-7	ug/L	3	3	0.021	0.021	--	NS
4-Chloroaniline	106-47-8	ug/L	3	3	0.021	0.021	14.6	N
4-Chlorophenyl-PhenylEther	7005-72-3	ug/L	3	3	0.016	0.016	--	NS
4-Methylphenol	106-44-5	ug/L	3	3	0.16	0.16	18.25	N
4-Nitroaniline	100-01-6	ug/L	3	3	0.14	0.14	--	NS
4-Nitrophenol	100-02-7	ug/L	3	3	1.3	1.3	--	NS
Acenaphthene	83-32-9	ug/L	3	3	0.013	0.013	36.5	N
Acenaphthylene[5]	208-96-8	ug/L	3	3	0.012	0.012	18.25	N
Acetophenone	98-86-2	ug/L	3	3	0.043	0.043	60.8	N
Anthracene	120-12-7	ug/L	3	3	0.014	0.014	182.5	N
Atrazine	1912-24-9	ug/L	3	3	0.026	0.026	0.304	N
Benzaldehyde	100-52-7	ug/L	3	3	0.051	0.051	365	N
Benzo(a)anthracene	56-55-3	ug/L	3	3	0.037	0.037	0.03	**Y**
Benzo(a)pyrene	50-32-8	ug/L	3	3	0.023	0.023	0.003	**Y**
Benzo(b)fluoranthene	205-99-2	ug/L	3	3	0.04	0.04	0.03	**Y**
Benzo(g,h,i)perylene[5]	191-24-2	ug/L	3	3	0.022	0.022	18.25	N

Table E.2-2.5
SWMU 71 Groundwater Non-detects Screening
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adj. Tap Water RBC	Maximum MDL Exceeds SL
Benzo(k)fluoranthene	207-08-9	ug/L	3	3	0.036	0.036	0.3	N
Bis(2-chloroethoxy)methane	111-91-1	ug/L	3	3	0.016	0.016	--	NS
Bis(2-chloroethyl)Ether	111-44-4	ug/L	3	3	0.016	0.016	0.0096	**Y**
Bis(2-chloroisopropyl)Ether	108-60-1	ug/L	3	3	0.047	0.047	0.26	N
Bis(2-ethylhexyl)Phthalate	117-81-7	ug/L	3	3	0.41	0.41	4.78	N
ButylBenzylPhthalate	85-68-7	ug/L	1	3	0.029	0.029	730	N
Caprolactam	105-60-2	ug/L	3	3	0.14	0.14	1,825	N
Carbazole	86-74-8	ug/L	3	3	0.018	0.018	3.35	N
Chrysene	218-01-9	ug/L	3	3	0.02	0.02	3	N
Di-n-butylphthalate	84-74-2	ug/L	3	3	0.38	0.38	365	N
Di-n-octylphthalate	117-84-0	ug/L	3	3	0.34	0.34	--	NS
Dibenz(a,h)anthracene	53-70-3	ug/L	3	3	0.026	0.026	0.003	**Y**
Dibenzofuran	132-64-9	ug/L	3	3	0.016	0.016	3.65	N
Diethylphthalate	84-66-2	ug/L	1	3	0.034	0.034	2,920	N
Dimethylphthalate	131-11-3	ug/L	3	3	0.016	0.016	--	NS
Fluoranthene	206-44-0	ug/L	3	3	0.016	0.016	146	N
Fluorene	86-73-7	ug/L	3	3	0.011	0.011	24.33	N
Hexachlorobenzene	118-74-1	ug/L	3	3	0.019	0.019	0.042	N
Hexachlorobutadiene	87-68-3	ug/L	3	3	0.018	0.018	0.859	N
Hexachlorocyclopentadiene	77-47-4	ug/L	3	3	0.13	0.13	21.9	N
Hexachloroethane[6]	67-72-1	ug/L	3	3	0.038	0.038	3.65	N
Indeno(1,2,3-cd)pyrene	193-39-5	ug/L	3	3	0.014	0.014	0.03	N
Isophorone	78-59-1	ug/L	3	3	0.031	0.031	70.5	N
N-Nitrosodiphenylamine	86-30-6	ug/L	3	3	0.019	0.019	13.67	N
N-Nitrosodi-n-propylamine	621-64-7	ug/L	3	3	0.03	0.03	0.0096	**Y**
Naphthalene	91-20-3	ug/L	2	3	0.023	0.023	0.651	N
Nitrobenzene	98-95-3	ug/L	3	3	0.026	0.026	0.353	N
Pentachlorophenol	87-86-5	ug/L	3	3	0.19	0.19	0.558	N
Phenanthrene[5]	85-01-8	ug/L	3	3	0.015	0.015	18.25	N
Phenol	108-95-2	ug/L	3	3	0.028	0.028	1095	N
Pyrene	129-00-0	ug/L	3	3	0.047	0.047	18.25	N
Explosives								
1,3,5-Trinitrobenzene	99-35-4	ug/L	3	3	0.045	0.045	109.5	N
1,3-Dinitrobenzene	99-65-0	ug/L	3	3	0.071	0.071	0.365	N
2,4-Dinitrotoluene	121-14-2	ug/L	3	3	0.092	0.092	7.3	N
2,6-Dinitrotoluene	606-20-2	ug/L	3	3	0.16	0.16	3.65	N
2,4,6-Trinitrotoluene[7]	118-96-7	ug/L	3	3	0.1	0.1	1.83	N
2-Amino-4,6-dinitrotoluene	355-72-78-2	ug/L	3	3	0.24	0.24	7.3	N
2-Nitrotoluene	88-72-2	ug/L	3	3	0.28	0.28	6.083	N
3-Nitrotoluene	99-08-1	ug/L	3	3	0.17	0.17	--	NS
4-Amino-2,6-dinitrotoluene	1946-51-0	ug/L	3	3	0.22	0.22	7.3	N
4-Nitrotoluene	99-99-0	ug/L	3	3	0.49	0.49	4.186	N
HMX	2691-41-0	ug/L	3	3	0.2	0.2	182.5	N
Nitrobenzene	98-95-3	ug/L	3	3	0.15	0.15	0.353	N
RDX	121-82-4	ug/L	3	3	0.092	0.092	0.609	N
Tetryl	479-45-8	ug/L	3	3	0.15	0.15	14.6	N
Nitroglycerin/PETN								
Nitroglycerin	55-63-0	ug/L	3	3	0.58	0.58	0.365	**Y**
PETN	78-11-5	ug/L	3	3	0.61	0.61	--	NS

Notes:

CAS = Chemical Abstracts Service
ug/L = Microgram per liter
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
PETN = Pentaerythritol Tetranitrate
MDL = Method Detection Limit
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
[1] = Lead Action Level used for screening
[2] = Tap Water RBC for methylmercury used for screening
[3] = Noncarcinogenic Tap Water RBC value for Aroclor 1016 used for screening
[4] = Noncarcinogenic Tap Water RBC value for 2,4,6-Trichlorophenol used for screening
[5] = Tap Water RBC value for pyrene used for screening
[6] = Noncarcinogenic Tap Water RBC value for Hexachloroethane used for screening
[7] = Noncarcinogenic Tap Water RBC values for 2,4,6-Trinitrotoluene used for screening

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available

Table E.2-3.1
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Exposure to Contaminants in SWMU 71 Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Surface Soil	Aluminum	mg/kg	10,456	21,642	33,000	21,642	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Antimony	mg/kg	2.834	11.94	16.4	11.94	mg/kg	99% Chebyshev (MVUE) UCL	ProUCL 4.0
	Arsenic	mg/kg	10.41	14.24	16.1	14.24	mg/kg	95% Student's t UCL	ProUCL 4.0
	Chromium	mg/kg	21.16	30.95	47	30.95	mg/kg	95% Student's t UCL	ProUCL 4.0
	Cobalt	mg/kg	5.51	9.242	13	9.242	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Iron	mg/kg	15,416	25,860	34,000	25,860	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Manganese	mg/kg	204.2	461.3	550	461.3	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Thallium	mg/kg	0.443	0.485	0.59	0.485	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Vanadium	mg/kg	27.94	54.94	91	54.94	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Aroclor 1248*	mg/kg	--	--	0.45	0.45	mg/kg	--	--
	Aroclor 1254	mg/kg	0.143	0.385	0.46	0.385	mg/kg	95% KM (t) UCL	ProUCL 4.0
	4-Methyl-2-pentanone	mg/kg	0.007	0.0143	0.016	0.0143	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Cyclohexane*	mg/kg	--	--	0.004	0.004	mg/kg	--	--
	Methylcyclohexane*	mg/kg	--	--	0.027	0.027	mg/kg	--	--

Notes:
FOD = frequency of detection
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram
* Due to the low frequency of detection, a mean and UCL were not calculated.

Table E.2-3.2
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Exposure to Contaminants in SWMU 71 Total Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Medium: Total Soil
Exposure Medium: Total Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Total Soil	Aluminum	mg/kg	28,405	35,775	69,000	35,775	mg/kg	95% Student's t UCL	ProUCL 4.0
	Antimony	mg/kg	1.16	1.764	16.4	1.764	mg/kg	95% Chebyshev (MVUE) UCL	ProUCL 4.0
	Arsenic	mg/kg	6.009	8.766	16.1	8.766	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Chromium	mg/kg	41.78	61.1	66	61.1	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	Cobalt	mg/kg	8.9	10.81	22	10.81	mg/kg	95% Student's t UCL	ProUCL 4.0
	Iron	mg/kg	32,864	39,796	62,000	39,796	mg/kg	95% Student's t UCL	ProUCL 4.0
	Lead	mg/kg	42.04	86.53	366	86.53	mg/kg	95% Chebyshev (MVUE) UCL	ProUCL 4.0
	Manganese	mg/kg	298.4	355.6	550	355.6	mg/kg	95% Student's t UCL	ProUCL 4.0
	Thallium	mg/kg	0.325	0.354	0.59	0.354	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Vanadium	mg/kg	60.46	74.59	130	74.59	mg/kg	95% Student's t UCL	ProUCL 4.0
	Aroclor 1248*	mg/kg	--	--	0.45	0.45	mg/kg	--	--
	Aroclor 1254	mg/kg	0.135	0.120	0.46	0.12	mg/kg	95% KM (t) UCL	ProUCL 4.0
	4-Methyl-2-pentanone	mg/kg	0.009	0.0111	0.016	0.0111	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Cyclohexane*	mg/kg	--	--	0.004	0.004	mg/kg	--	--
	Methylcyclohexane	mg/kg	0.0137	0.0522	0.0265	0.0265	mg/kg	99% KM (Chebyshev) UCL	ProUCL 4.0
	Di-n-octylphthalate*	mg/kg	--	--	0.14	0.14	mg/kg	--	--
	Benzo(a)pyrene	mg/kg	0.0485	0.0595	0.12	0.0595	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Dibenz(a,h)anthracene*	mg/kg	--	--	0.21	0.21	mg/kg	--	--
	Total Equivalents 2,3,7,8-TCDD**	mg/kg	--	--	6.20E-06	6.20E-06	mg/kg	--	--

Notes:
FOD = frequency of detection
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram
* Due to the low frequency of detection, a mean and UCL were not calculated.
* Due to the sample size (3 samples) a mean and UCL were not calculated.

Table E.2-4.1a
Values used for Daily Intake Equations for Current/Future Scenario - Surface Soil - Exposure Medium Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Maintenance Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
Dermal Absorption *	Maintenance Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) Fraction ingested assumed 100%.

*See Table E.2-4.3 for chemical specific dermal absorption fractions

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

cm^2 = square centimeter

USEPA = U.S. Environmental Protection Agency

EPC = Exposure Point Concentration

Table E.2-4.1b
Values used for Daily Intake Equations for Current/Future Scenario - Surface Soil - Exposure Medium Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Maintenance Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.5	m^3/hr	USEPA, 1989	
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	(2)	
			Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/VF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.5	m^3/hr	USEPA, 1991	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) PEFs provided on Table E.2-4.4

(3) VFs provided on Table E.2-4.3

USEPA, 1989. Risk Assessment Guidance for Superfund Volume I - Human Health Evaluation Manual (Part A). Interim Final. EPA/540/1-89/002.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

m^3/hour = cubic meters per hour

USEPA = U.S. Environmental Protection Agency

Table E.2-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Maintenance Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
	Construction Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	330	mg/day	USEPA, 2002	
	Commercial Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	50	mg/day	USEPA, 2002	
	Resident	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
		Child	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	200	mg/day	USEPA, 1991	

Table E.2-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption *	Maintenance Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Construction Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.3	mg/(cm^2-event)	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 2002	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Commercial Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Resident	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.07	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	5,700	cm^2	USEPA, 2004	

Table E.2-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption Cont.*	Resident Cont.	Child	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.2	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	2,800	cm^2	USEPA, 2004	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) Fraction ingested assumed 100%.

*See Table E.2-4.3 for chemical specific dermal absorption fractions

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

cm^2 = square centimeter

USEPA = U.S. Environmental Protection Agency

EPC = Exposure Point Concentration

Table E.2-4.1d
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Maintenance Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.5	m^3/hr	USEPA, 1989	
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	(2)	
			Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/VF / BW x AT
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.5	m^3/hr	USEPA, 1991	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	
	Construction Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	2.5	m^3/hr	USEPA, 1991	
				PEF	Particulate Emission Factor	1.17E+06	m^3/kg	(2)	
			Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/VF / BW x AT
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	2.5	m^3/hr	USEPA, 1991	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	
	Commercial Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	25	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.0	m^3/hr	USEPA, 1989	
				PEF	Particulate Emission Factor	6.61E+08	m^3/kg	(2)	

Table E.2-4.1d
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation Cont.	Commercial Worker Cont.	Adult Cont.	Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/VF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.0	m^3/hr	USEPA, 1989	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	
			Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Air	Chemical Specific	mg/kg	(4)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.0	m^3/hr	USEPA, 1989	
	Resident	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	2	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.83	m^3/hr	(5)	
				PEF	Particulate Emission Factor	6.61E+08	m^3/kg	(2)	
			Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/VF}{BW \times AT}$
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	2	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.83	m^3/hr	(5)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	
			Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CA	Chemical Concentration in Air	Chemical Specific	mg/kg	(4)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET}{BW \times AT}$
				ED	Exposure Duration	16.4	years	USEPA, 1997	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	24	hr/day	USEPA, 1991	
				IR	Inhalation Rate	0.83	m^3/hr	(5)	

Table E.2-4.1d
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation Cont.	Resident Cont.	Child	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	6	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.5	m^3/hr	(6)	
				PEF	Particulate Emission Factor	6.61E+08	m^3/kg	(2)	
			Outdoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/VF}{BW \times AT}$
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	6	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.5	m^3/hr	(6)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	(3)	
			Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CA	Chemical Concentration in Air	Chemical Specific	mg/kg	(4)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET}{BW \times AT}$
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	18	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.5	m^3/hr	(6)	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) PEFs provided on Table E.2-4.4

(3) VFs provided on Table E.2-4.3

(4) Chemical Concentration in Air for Indoor Vapors calculated using Johnson and Ettinger Model. See Table E.2-4.5

(5) The inhalation rate is calculated using a daily long term rate of 20 m^3/day (USEPA, 1991) divided by 24 hours to derive hourly inhalation rate of 0.83 m^3/hour.

(6) The inhalation rate is calculated using a daily long term rate of 12 m^3/day (USEPA, 2003) divided by 24 hours to derive hourly inhalation rate of 0.5 m^3/hour.

USEPA, 1989. Risk Assessment Guidance for Superfund Volume I - Human Health Evaluation Manual (Part A). Interim Final. EPA/540/1-89/002.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 1997. Exposure Factors Handbook. Office of Research and Development. EPA/600/P-95/002Fa through Fc.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

kg/mg = Kilogram Per Millogram
mg/kg = Milligram Per Kilogram
hr/day = hour per day
m^3/hour = cubic meters per hour
USEPA = U.S. Environmental Protection Agency

Table E.2-4.2a
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Commercial Worker	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	1	L/day	USEPA, 1991	
	Resident	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	2	L/day	USEPA, 1991	
		Child	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	1	L/day	USEPA, 1991	
Dermal Absorption*	Commercial Worker	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$ *where*
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	*Organics:*
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	if $t_{event} \le t^*$, $DA_{event} = 2 \times CF1 \times CF2 \times FA \times Kp \times CW \times [(6 \times \tau_{event} \times t_{event})/\pi]^{1/2}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	if $t_{event} > t^*$, $DA_{event} = CF1 \times CF2 \times FA \times Kp \times CW \times [(t_{event}/(1+B))+ 2 \times \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	800	cm^2	(2)	*Inorganics:*
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	$DA_{event} = CF1 \times CF2 \times Kp \times CW \times t_{event}$
				t_{event}	Event Duration	1	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	

Table E.2-4.2a
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption Continued*	Resident	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$ *where*
				BW	Body Weight	70	kg	USEPA, 1991	*Organics:*
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	if $t_{event} \le t^*$, DA_{event} = 2 x CF1 x CF2 x FA x Kp x CW x $[(6 x \tau_{event} x t_{event})/\pi]^{1/2}$
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	24	years	USEPA, 1991	if $t_{event} > t^*$, DA_{event} = CF1 x CF2 x FA x Kp x CW x $[(t_{event}/(1+B))+ 2 x \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	*Inorganics:*
				SA	Skin Surface Area Available for Contact	18,000	cm^2	USEPA, 2004	DA_{event} = CF1 x CF2 x Kp x CW x t_{event}
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	
				t_{event}	Event Duration	0.58	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	
		Child	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$ *where*
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	*Organics:*
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	if $t_{event} \le t^*$, DA_{event} = 2 x CF1 x CF2 x FA x Kp x CW x $[(6 x \tau_{event} x t_{event})/\pi]^{1/2}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	if $t_{event} > t^*$, DA_{event} = CF1 x CF2 x FA x Kp x CW x $[(t_{event}/(1+B))+ 2 x \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	6,600	cm^2	USEPA, 2004	*Inorganics:*
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	DA_{event} = CF1 x CF2 x Kp x CW x t_{event}
				t_{event}	Event Duration	1	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	

Table E.2-4.2a
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

(1) Best Professional Judgement. Based on the head, hands, and forearms.

(2) Best Professional Judgement. Based on the mean surface area for hands for men and women.

*See Table E.2-4.6 for chemical specific parameters used to calculate absorbed dose per event

Note that VOCs were not analytes of interest for the site; therefore, the outdoor and indoor vapor inhalation pathways are not quantitatively assessed for the site.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final.

VDEQ, 2006. Voluntary Remediation Program Risk Assessment Guidance. www.deq.virginia.gov/vrprisk/raguide.html.

kg = Kilogram

ug/L = Microgram Per Liter

mg/kg = milligram per kilogram

cm^2 = square centimeter

cm^3 = Cubic Centimeter

L/day = liter/day

USEPA = U.S. Environmental Protection Agency

VDEQ = Virginia Department of Environmental Quality

EPC = Exposure Point Concentration

Table E.2-4.2b
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Construction Worker	Adult	Trench Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USUSEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USUSEPA, 1991	
				BW	Body Weight	70	kg	USUSEPA, 1991	
				CA	Chemical Concentration in Outdoor Air	calculated	mg/m^3	(1)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET \times FI}{BW \times AT}$
				ED	Exposure Duration	1	years	USUSEPA, 1991	
				EF	Exposure Frequency	125	days/year	VDEQ, 2006	
				ET	Exposure Time	8	hr/day	USUSEPA, 1991	
				IR	Inhalation Rate	2.5	m^3/hr	USUSEPA, 2002	
				FI	Fraction of Exposure, Air	1	unitless	(2)	
	Commercial Worker	Adult	Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CA	Chemical Concentration in Indoor Air	calculated	mg/m^3	(3)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET \times FI}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.0	m^3/hr	USEPA, 1997	
				FI	Fraction of Exposure, Air	1	unitless	(2)	
	Resident	Adult	Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CA	Chemical Concentration in Indoor Air	calculated	mg/m^3	(3)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET \times FI}{BW \times AT}$
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	16.4	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.83	m^3/hr	(4)	
				FI	Fraction of Exposure, Air	1	unitless	(2)	
			Vapors while showering with groundwater	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	10,950	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CA	Chemical Concentration in Shower Air	calculated	mg/m^3	(5)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET \times FI}{BW \times AT}$
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	0.261	hr/day	(6)	
				IR	Inhalation Rate	0.83	m^3/hr	USEPA, 1997	
				FI	Fraction of Exposure, Air	1	unitless	(2)	

Table E.2-4.2b
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Air
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation Cont.	Resident Cont.	Child	Indoor Vapors	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CA	Chemical Concentration in Indoor Air	calculated	mg/m^3	(3)	CDI (mg/kg-day) = $\frac{CA \times IR \times EF \times ED \times ET \times FI}{BW \times AT}$
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	18	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.5	m^3/hr	(7)	
				FI	Fraction of Exposure, Air	1	unitless	(2)	

Notes:

(1) See Table E.2-4.9 for trech air calculations.

(2) Best Professional Judgement. Based on 100% inhalation fraction.

(3) Chemical Concentration in Air for Indoor Vapors calculated using Johnson and Ettinger Model (See Table E.2-4.7).

(4) The inhalation rate is calculated using a daily long term rate of 20 m^3/day (USEPA, 1991) divided by 24 hours to derive hourly inhalation rate of 0.83 m^3/hour.

(5) Chemical Concentration in Air for Vapors while showering with groundwater calculated using Foster and Chrostowski Inhalation Model (See Table E.2-4.8).

(6) ET calculated using ET=(Ds+((exp(-Ra*t))/Ra - ((exp(Ra(Ds-t))/Ra)))*1hr/60min

Ds (shower time) =	30	min
t (total time in shower room) =	60	min
Ra (air exchange rate) =	0.01667	per min
ET=	0.261	hour/day

(7) The inhalation rate is calculated using a daily long term rate of 12 m^3/day (USEPA, 2003) divided by 24 hours to derive hourly inhalation rate of 0.5 m^3/hour.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 1997. Exposure Factors Handbook. Office of Research and Development. EPA/600/P-95/002Fa.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

VDEQ, 2006. Voluntary Remediation Program Risk Assessment Guidance. www.deq.virginia.gov/vrprisk/raguide.html.

kg = Kilogram
ug/L = Microgram Per Liter
mg/kg = milligram per kilogram
cm^3 = Cubic Centimeter
L/day = liter/day
USEPA = U.S. Environmental Protection Agency
VDEQ = Virginia Department of Environmental Quality

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Table E.2-4.3.RME
Dermal Absorption Fractions and Volatilization Factors for Soil - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	ABSd * (m^3/kg)	D_l (cm^2/s)	D_w (cm^2/s)	K_{oc} (cm^3/g)	K_d (cm^3/g)	H (unitless)	Da (cm^2/sec)	$VF_{C/I\ Worker}$/ $VF_{Maint.\ Worker}$ (m^3/kg)	$VF_{Const.\ Worker}$ (m^3/kg)	$VF_{Adult\ Resident}$ (m^3/kg)	$VF_{Child\ Resident}$ (m^3/kg)
Aluminum	7429-90-5	1.00E-02	--	--	--	--	--	--	--	--	--	--
Antimony	7440-36-0	1.00E-02	--	--	--	--	--	--	--	--	--	--
Arsenic	7440-38-2	3.00E-02	--	--	--	--	--	--	--	--	--	--
Chromium	7440-47-3	1.00E-02	--	--	--	--	--	--	--	--	--	--
Cobalt	7440-48-4	1.00E-02	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	1.00E-02	--	--	--	--	--	--	--	--	--	--
Iron	7439-89-6	1.00E-02	--	--	--	--	--	--	--	--	--	--
Lead	7439-92-1	1.00E-02	--	--	--	--	--	--	--	--	--	--
Manganese	7439-96-5	1.00E-02	--	--	--	--	--	--	--	--	--	--
Mercury	7439-97-6	1.00E-02	--	--	--	--	--	--	--	--	--	--
Thallium	7440-28-0	1.00E-02	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	1.00E-02	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	1.00E-02	--	--	--	--	--	--	--	--	--	--
Aroclor 1248	12672-29-6	1.40E-01	--	--	--	--	--	--	--	--	--	--
Aroclor 1254	11097-69-1	1.40E-01	--	--	--	--	--	--	--	--	--	--
4-Methyl-2-Pentanone	108-10-1	3.00E-02	7.50E-02	7.80E-06	1.05E+01	1.17E-01	5.66E-03	1.04E-04	1.47E+04	4.01E+03	1.44E+04	7.19E+03
Cyclohexane	110-82-7	5.00E-04	8.39E-02	9.10E-06	6.35E+02	7.11E+00	8.00E+00	4.10E-03	2.33E+03	6.37E+02	2.29E+03	1.14E+03
Methylcyclohexane	108-87-2	3.00E-02	7.00E-02	8.28E-06	8.65E+02	9.69E+00	1.76E+01	5.01E-03	2.11E+03	5.77E+02	2.07E+03	1.03E+03
Di-n-octlyphthalate	117-84-0	1.00E-01	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	1.30E-01	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	53-70-3	1.30E-01	--	--	--	--	--	--	--	--	--	--
2,3,7,8-TCDD TEQ	1746-01-6	3.00E-02	--	--	--	--	--	--	--	--	--	--

Notes:
CAS = Chemical Abstract Service
ABS_d = Dermal Absorption Fraction
VF = Volatilization Factor
D_a = Apparent Diffusivity
m^3/kg = cubic meters per kilogram
cm2/s = centimeter squared per second

*ABS_d values are taken from Exhibit 3-4, Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation and Manual, Part E; Supplemental Guidance for Dermal Risk Assessment, July 2004, and Region III Technical Guidance, Assessing Dermal Exposure in Soil, December 1995.

Table E.2-4.3.RME
Dermal Absorption Fractions and Volatilization Factors for Soil - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes continued:

D_a values calculated using the following equation and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.
Equation 4-8 from USEPA, 2002:

$D_a = [((\Theta_a^{10/3} \times Di \times H) + (\Theta_w^{10/3} \times D_w))/n^2]/[((\rho_b \times K_d) + \Theta_w + (\Theta_a \times H)]$

Θ_a (L_{air}/L_{soil}) =	0.28	default
Θ_w (L_{water}/L_{soil}) =	0.15	default
D_i(cm2/sec) =	varies	
D_w(cm2/sec) =	varies	
H(unitless) =	varies	
n (L_{Pore}/L_{soil}) =	0.43	default
ρ_b (g/cm^3) =	1.50	default
K_d (cm^3/g) =	varies	
K_{oc} (cm^3/g) =	varies	
foc (g/g) =	0.011	

VF (soil only) values for commercial/industrial worker, adult resident, and child resident, and adolescent tresspasser calculated using the following equations and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.
Equation 4-8 from USEPA, 2002:

$VF = Q/C_{vol} * (3.14 * D_A * T)^{1/2} * CF/(2 * \rho_b * D_a)$

Q/C_{vol} (g/m2-s)/kg/m3) =	90.12	calculated value
D_A (cm^2/sec) =	varies	chemical specific (see above)
T (sec) =	varies	receptor specific exposure interval (T= ED(yrs)*365 days/year*24 hours/day*60 min/hour*60sec/min)
		(Maintenance Worker=7.88E+08 sec, Commercial/Industrial Worker=7.88E+08 sec, Adult Resident=7.56E+08, and Child Resident=1.89E+08)
CF (m^2/cm^2) =	1.00E-04	default
ρ_b (g/cm^3)	1.5	default

Exhibit D-3 from USEPA, 2002:

$Q/C_{vol} = A * e^{((\ln A_{site} - B)^2/C)}$ =

	90.12	
A =	9.9253	Huntington value
B =	18.6636	Huntington value
C =	211.8862	Huntington value
A_{site} (acres)=	0.052	contaminated site area

VF (soil only) values for construction worker were calculated using the following equations and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.
Equation 5-14 from USEPA 2002:

$VF = Q/C_{sa} * 1/F_D * (3.14 * D_A * T)^{1/2} * CF/(2 * \rho_b * D_A)$

Q/C_{sa} (g/m^2-s)/kg/m^3) =	22.77	calculated value
F_D (unitless) =	0.185	default
D_A (cm^2/sec) =	varies	chemical specific (see above)
T (sec) =	3.15E+07	receptor specific exposure interval (T= ED(yrs)*365 days/year*24 hours/day*60 min/hour*60sec/min)
CF (m^2/cm^2) =	1.00E-04	default
ρ_b (kg/L) =	1.5	default

Equation 5-15 from USEPA, 2002:

$Q/C_{sa} = A * e^{((\ln A_c - B)^2/C)}$ =

	22.77	
A=	2.4538	default
B =	17.566	default
C =	189.0426	default
A_c (acres)=	0.052	contaminated site area

Table E.2-4.4.RME
PEF Calculations - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Commercial/Industrial Worker

Equation 4-5 from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$PEF = Q / C_{wind} \cdot \frac{3{,}600 s/h}{0.036 \cdot (1-V) \cdot (U_m / U_t)\text{^}3 \cdot F(x)}$$

Parameter	Value	
PEF	1.31E+09	
Q/C_{wind}	90.12	calculated below
V	0.5	default
U_m	4.69	default
U_t	11.32	default
F(x)	0.194	default

PEF = particulate emission factor (m^3/kg)
s/h = seconds per hour
Q/Cwind = Inverse of the ratio of the geometric mean air concentration to the emission flux at the center of a square source (g/m^3-s per kg/m^3)
V = fraction of vegatative cover (unitless)
U_m = mean annual windspeed (m/s)
U_t = equivalent threshold value of windspeed at 7m (m/s)
F(x) = function dependent on U_m/U_t derived using Cowherd et al. (1985)
Site Area = 0.052

Q/C_{wind} calculated in accordance with Exhibit D-2 from USEPA, 2002
using A, B, and C values for Huntington, WV:
$Q/C_{wind} = A*e\text{^}((\ln A_{site} - B)^2/C))$

Q/C_{wind}=	90.12	
A =	9.9253	unitless
B =	18.6636	unitless
C =	211.8862	unitless
A_{site}=	0.052	acres

Table E.2-4.4.RME
PEF Calculations - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Construction Worker

Equation 5-5 from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$PEF_{sc} = Q / C_{sr} \cdot \frac{1}{F_D} \cdot \left[\frac{T \cdot A_R}{556 \cdot (W/3)^{\wedge} 0.4 \cdot \frac{(365\ d/yr - p)}{365\ d/yr} \cdot \sum VKT} \right]$$

Parameter	Value	
PEF_{sc}	2.36E+06	
Q/C_{sr}	37.09	calculated
F_D	0.185	default
T (sec)	7,488,000	assumed-see below
A_R (m^2)	88	calculated
W (tons)	8	assumed-see below
p (days/yr)	140	determined-see below
sumVKT (km)	111	assumed-see below

PEF_{sr} = subchronic road particulate emission factor (m^3/kg)
Q/C_{sr} = Inverse of the ratio of the 1-h geometric mean air concentration to the emission flux along a straight road segment bisecting a square site (g/m2-s per kg/m3)
F_D = dispersion correction factor (unitless)
T = total time over which construction occurs-total time period assumed to be 6 months
(52wks x 5days per week x 8 hours per day x 3,600 s per hour)
A_R = surface area of contaminated road segment (m^2)
L_R = length of road segment (assumed to equal to (0.052 acres*43,560 ft^2/acre)$^{1/2}$)
W_R = width of road segment (assumed to be 20 ft)
$A_R = L_R \times W_R \times 0.092903 m^2/ft^2$
A_R= 88 m^2
W = mean vehicle weight assumed to be 8 tons ([(20 cars * 2 tons/car)+(10 trucks*20 tons/truck)]/30 vehicles)
p = number of days with at least 0.01 inches of precipitation (from Exhibit 5-2 140 days/year)
sumVKT = sum of fleet vehicle kilometers traveled during the exposure duration (km)
(30 of vehicles x 0.00143 of km/day x 52wks x 5 days/wk)

Q/C_{sr} calculated in accordance with Equation 5-6:
using A, B, and C default values:
$Q/C_{sr} = A*e^{\wedge}((\ln A_s - B)^2/C))$

Q/C_{sr}=	37.09	g/m^2-s per kg/m^3
A =	12.9351	unitless
B =	5.7383	unitless
C =	71.7711	unitless
A_s =	0.052	acres

TABLE E.2-4.5
Soil Inhalation Indoor Air Concentration Summary - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	C_S mg/kg	C_a mg/m^3
4-Methyl-2-Pentanone	108-10-1	1.11E-02	9.98E-04
Cyclohexane	110-82-7	4.00E-03	3.61E-02
Methylcyclohexane	108-87-2	2.65E-02	4.05E-01

Notes:

Indoor Air Concentrations Modeled Using Johnson and Ettinger Model.

Non-default Model Inputs: Depth below grade to bottom of enclosed floor space (15 cm)
Depth below grade to top of contamination (15 cm)
Soil Type (CL)

Table E.2-4.6
Parameter Values Used for Groundwater - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	FA	Kp (cm/hr)	tau $_{event}$ (hr)	B	t* (hr)
Chloroform	67-66-3	1.0	6.8E-03	5.0E-01	2.9E-02	1.2E+00

Notes:
Organic parameter values are taken from Organic values from Organic Chemicals in Water Spreadsheet
(http://www.epa.gov/oswer/riskassessment/ragse/index.htm)

TABLE E.2-4.7
Groundwater Inhalation Indoor Air Concentration Summary - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	C_W ug/L	C_a mg/m^3
Chloroform	67-66-3	2.40E+01	1.25E-04

Notes:

Indoor Air Concentrations Modeled Using Johnson and Ettinger Model.

Non-default Model Inputs: Depth below grade to bottom of enclosed floor space (15 cm)
Depth below grade to water table (2,743 cm)
Soil Type (CL)

TABLE E.2-4.8
Groundwater Inhalation Shower Stall Air Concentration Calculations - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	C_W ug/L	MW g/mole	H atm-m^3/mole	k_l cm/hour	k_g cm/hour	K_L cm/hour	K_{aL} cm/hour	C_{wd} ug/L	S ug/m^3-min	C_a mg/m^3
Chloroform	67-66-3	2.40E+01	119.4	3.7E-03	12.14	1164.91	1.14E+01	1.52E+01	9.54E+00	3.18E+01	1.91E+00

Equations:

k_l (liquid-film transfer coefficient) = $20*(44/MW)^{0.5}$

k_g (gas-film transfer coefficient) = $3000*(18/MW)^{0.5}$

K_L (overall mass transfer coefficient) = $(1/k_l+(R*t/H*k_g))^{-1}$

K_{aL} (overall mass transfer coefficient adjusted to shower water temperature) = $K_L*((T*u_s/T_s*u_l)^{-0.5}$

C_{wd} (VOC concentration leaving shower droplet) = $C_w*(1-exp(-K_{aL}*t_s/60*d)$

S (VOC generation rate) = C_{wd}*FR/SV

C_a (VOC concentration in shower air) =(S/R_a)*(1mg/1000ug)

Constants:

R (gas constant)	8.20E-05	atm-m^3/mole-K
T (room temperature)	298	K
T_s (water temp)	318	K
u_s (water viscosity at T_s)	0.596	centapoise
u_l (water viscosity at T)	1.002	centapoise
t_s (shower droplet drop time)	2	sec
d (droplet diameter)	1	mm
FR (shower flow rate)	20	L/min
SV (shower room air volume)	6	m^3
R_a (air exchange rate)	0.01667	permin

TABLE E.2-4-9
Groundwater Inhalation Construction Worker Trench Gas Concentration Calculations - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	C_W ug/L	H_i atm-m^3/mole	D_{air} cm^2/sec	VF L/m^3	C_a mg/m^3
Chloroform	67-66-3	2.40E+01	3.67E-03	1.04E-01	1.39E-03	3.33E-05

Notes:

Exposure-point Concentrations calculated using VDEQ VRP Model for construction/utility workers in a trench: deep Goundwater greater than 15 feet

Equations:

$VF = (H_i*D_{air}*AC_{vad}^{3.33}*A*F*CF1*CF2*CF3)/(R*T*L_d*ACH*V*Por_{vad}^2)$

$C_a = C_W*VF*CF4$

Constants:

H_i (Henry's Law Constant)	chem spec	atm-m^3/mol
D_{air} (diffusion coefficient in air)	chem spec	cm^2/s
AC_{vad} (volumetric air content in vadose zone soil)	0.25	cm^3/cm^3
L (length of trench)	2.44	m
W (width of trench)	0.91	m
A (area of trench - L*W)	2.23	m^2
F (fraction of floor through which contaminant can enter)	1	untiless
R (gas constant)	8.2E-05	atm-m^3/mole-K
T (average system absolute temp)	298	K
L_d (dist. b/w trench bottom and groundwater)	2,268	cm
d (depth of trench)	4.57	m
V (volume of trench)	10.19	m^3
ACH (air changes per hour)	2	per hour
Por_{vad} (total soil porosity in vadose zone)	0.44	cm^3/cm^3
CF1	0.001	L/cm^3
CF2	10,000	cm^2/m^2
CF3	3600	sec/hour
CF4	0.001	mg/ug

Table E.2-5.1
Non-Cancer Toxicity Data - Oral/Dermal - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s)
Aluminum	7429-90-5	Chronic	1.00E+00	mg/kg-day	1	1.00E+00	mg/kg-day	developmental CNS	100	PPRTV	07/26/2001
Antimony	7440-36-0	Chronic	4.00E-04	mg/kg-day	0.15	6.00E-05	mg/kg-day	blood	1000	IRIS	10/22/2007
Antimony	7440-36-0	Subchronic	2.00E-04	mg/kg-day	0.15	3.00E-05	mg/kg-day	blood	300	PPRTV	07/26/1999
Arsenic	7440-38-2	Chronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	skin/ vascular	3	IRIS	10/22/2007
Arsenic	7440-38-2	Subchronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	skin	3	HEAST	07/31/1997
Chromium(2)	7440-47-3	Chronic	3.00E-03	mg/kg-day	0.025	7.50E-05	mg/kg-day	GI tract/fetus/bone marrow/liver	900	IRIS	10/22/2007
Chromium(2)	7440-47-3	Subchronic	2.00E-02	mg/kg-day	0.025	5.00E-04	mg/kg-day	GI tract/fetus/bone marrow/liver	100	HEAST	07/31/1997
Cobalt	7440-48-4	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	blood	10	PPRTV	01/15/2002
Copper	7440-50-8	Chronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	GI tract	NA	HEAST	07/31/1997
Copper	7440-50-8	Subchronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	GI tract	NA	HEAST	07/31/1997
Iron	7439-89-6	Chronic	7.00E-01	mg/kg-day	1	7.00E-01	mg/kg-day	blood/ liver/ GI tract	1	PPTRV	01/05/1999
Manganese	7439-96-5	Chronic	2.00E-02	mg/kg-day	0.04	8.00E-04	mg/kg-day	CNS	1	IRIS	10/22/2007
Mercury(3)	7439-97-6	Chronic	3.00E-04	mg/kg-day	0.07	2.10E-04	mg/kg-day	immune system	1000	IRIS	10/22/2007
Thallium	7440-28-0	Chronic	7.00E-05	mg/kg-day	1	7.00E-05	mg/kg-day	liver/ blood/ hair	3000	Other, Region III	10/11/2007
Vanadium	7440-62-2	Chronic	1.00E-03	mg/kg-day	0.026	2.60E-05	mg/kg-day	kidney	NA	NCEA, Region III	10/25/2005
Vanadium	7440-62-2	Subchronic	7.00E-03	mg/kg-day	0.026	1.80E-04	mg/kg-day	kidney/ blood	100	HEAST	07/31/1997
Zinc	7440-66-6	Chronic	3.00E-01	mg/kg-day	1	3.00E-01	mg/kg-day	blood	3	IRIS	10/22/2007
Zinc	7440-66-6	Subchronic	3.00E-01	mg/kg-day	1	3.00E-01	mg/kg-day	blood	3	HEAST	07/31/1997
Aroclor 1248	12672-29-6	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Aroclor 1254	11097-69-1	Chronic	2.00E-05	mg/kg-day	1	2.00E-05	mg/kg-day	eyes	300	IRIS	10/22/2007
Aroclor 1254	11097-69-1	Subchronic	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	immune system	100	HEAST	07/31/1997
Chloroform	67-66-3	Chronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	liver	100	IRIS	10/22/2007
Chloroform	67-66-3	Subchronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	liver	1000	HEAST	07/31/1997
4-Methyl-2-Pentanone	108-10-1	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Cyclohexane	110-82-7	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	117-84-0	Chronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	liver/thyroid	1000	PPRTV	09/11/2002
Di-n-octylphthalate	117-84-0	Subchronic	4.00E-01	mg/kg-day	1	4.00E-01	mg/kg-day	liver/thyroid	100	PPRTV	09/11/2002
Benzo(a)pyrene	50-32-8	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD TEQ	1746-01-6	NA	NA	NA	1	NA	NA	NA	NA	NA	NA

Notes:

CAS = Chemical Abstract Service
RfD = Reference Dose
mg/(kg-d) = milligrams per kilogram day
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available
(1) Oral absorption efficiency for dermal from Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005. 2004.
(2) Chromium VI toxicity value used
(3) Mercuric chloride values used for oral/dermal exposure to soil

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III, and HEAST.
For IRIS values, the date of the IRIS search is provided.
For HEAST values, the date of HEAST is provided.
For Region III values, the date of the Region III RBC Table is provided.
For PPRTV/NCEA, date of paper is provided.

Table E.2-5.2
Non-Cancer Toxicity Data - Inhalation - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units	Value	Units			Source(s)	Date(s)
Aluminum	7429-90-5	Chronic	3.50E-03	mg/m3	1.00E-03	mg/kg-day	CNS	300	PPRTV, Region III	10/11/2007
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	Subchronic	4.00E-04	mg/m3	0.00011	mg/kg-day	lungs	100	PPRTV	07/26/1999
Arsenic	7440-38-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium(1)	7440-47-3	Chronic	1.00E-04	mg/m3	2.90E-05	mg/kg-day	respiratory	300	IRIS	10/22/2007
Cobalt	7440-48-4	Chronic	2.00E-05	mg/m3	5.70E-06	mg/kg-day	respiratory	100	PPRTV	01/15/2002
Copper	7440-50-8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	Chronic	5.00E-05	mg/m3	1.43E-05	mg/kg-day	CNS	1000	IRIS	10/22/2007
Mercury	7439-97-6	Chronic	3.00E-04	mg/m3	8.60E-05	mg/kg-day	CNS	30	IRIS	10/22/2007
Mercury	7439-97-6	Subchronic	3.00E-04	mg/m3	8.60E-05	mg/kg-day	CNS	30	HEAST	07/31/1997
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	12672-29-6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	67-66-3	Chronic	4.90E-02	mg/m3	1.40E-02	mg/kg-day	liver	NA	NCEA, Region III	10/11/2007
4-Methyl-2-Pentanone	108-10-1	Chronic	3.00E+00	mg/m3	8.60E-01	mg/kg-day	fetus	300	IRIS	10/22/2007
Cyclohexane	110-82-7	Chronic	6.00E+00	mg/m3	1.70E+00	mg/kg-day	fetus	300	IRIS	10/22/2007
Methylcyclohexane	108-87-2	Chronic	3.00E+00	mg/m3	8.60E-01	mg/kg-day	kidney	100	HEAST	07/31/1997
Methylcyclohexane	108-87-2	Subchronic	3.00E+00	mg/m3	8.60E-01	mg/kg-day	kidney	100	HEAST	07/31/1997
Di-n-octylphthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD TEQ	1746-01-6	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

RfC = Reference Concentration
RfD = Reference Dose
mg/m^3 = milligrams per cubic meter
mg/(kg-d) = milligrams per kilogram day
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System

(1) Toxicity data for chromium VI particulates
HEAST = Health Effects Assessment Summary Tables
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III, VDEQ, and HEAST.
For IRIS values, the date of the IRIS search is provided.
For PPRTV/NCEA values, the date of the paper is provided.
For Region III values, the date of the Region III RBC Table is provided.
For HEAST values, the date of HEAST is provided.

Table E.2-6.1
Cancer Toxicity Data - Oral/Dermal - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
		Value	Units		Value	Units		Source(s)	Date(s)
Aluminum	7429-90-5	NA	NA	1	NA	NA	NA	NA	NA
Antimony	7440-36-0	NA	NA	0.15	NA	NA	NA	NA	NA
Arsenic	7440-38-2	1.50E+00	1/(mg/kg-day)	1	1.50E+00	1/(mg/kg-day)	A	IRIS	10/22/2007
Chromium(2)	7440-47-3	NA	NA	0.025	NA	NA	Cannot Be Determined	NA	NA
Cobalt	7440-48-4	NA	NA	1	NA	NA	NA	NA	NA
Copper	7440-50-8	NA	NA	1	NA	NA	D	NA	NA
Iron	7439-89-6	NA	NA	1	NA	NA	NA	NA	NA
Manganese	7439-96-5	NA	NA	0.04	NA	NA	D	NA	NA
Mercury	7439-97-6	NA	NA	1	NA	NA	D	NA	NA
Thallium	7440-28-0	NA	NA	1	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	0.026	NA	NA	NA	NA	NA
Zinc	7440-66-6	NA	NA	1	NA	NA	D	NA	NA
Aroclor 1248	12672-29-6	2.00E+00	1/(mg/kg-day)	1	2.00E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Aroclor 1254	11097-69-1	2.00E+00	1/(mg/kg-day)	1	2.00E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Chloroform	67-66-3	NA	NA	1	NA	NA	B2	NA	NA
4-Methyl-2-Pentanone	108-10-1	NA	NA	1	NA	NA	NA	NA	NA
Cyclohexane	110-82-7	NA	NA	1	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	NA	NA	1	NA	NA	NA	NA	NA
Di-n-octlyphthalate	117-84-0	NA	NA	1	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	7.30E+00	1/(mg/kg-day)	1	7.30E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Dibenz(a,h)anthracene	53-70-3	7.30E+00	1/(mg/kg-day)	1	7.30E+00	1/(mg/kg-day)	B2	NCEA, Region III	10/11/2007
2,3,7,8-TCDD TEQ	1746-01-6	1.50E+05	1/(mg/kg-day)	1	1.50E+05	1/(mg/kg-day)	B2	HEAST	07/31/1997

Notes:

CSF = Cancer Slope Factor
mg/(kg-d) = Milligrams Per Kilogram Day
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
NA = Not Available
Cancer Guideline Description:
A = Human carcinogen
B1 = Probable human carcinogen - indicates that limited human data are available.
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C = Possible human carcinogen
D = Not classifiable as a human carcinogen

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III and VDEQ.
For IRIS values, the date of the IRIS search is provided.
For HEAST values, the date of the HEAST Table is provided.

(1) Oral absorption efficiency for dermal from Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. . EPA/540/R/99/005. 2004
(2) Chromium VI toxicity data used.

Table E.2-6.2
Cancer Toxicity Data - Inhalation - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description	CSF	
		Value	Units	Value	Units		Source(s)	Date(s)
Aluminum	7429-90-5	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA
Arsenic	7440-38-2	4.30E+00	1/(mg/m3)	1.50E+01	1/(mg/kg-day)	A	IRIS	10/22/2007
Chromium(1)	7440-47-3	1.20E+01	1/(mg/m3)	4.10E+01	1/(mg/kg-day)	A	IRIS	10/22/2007
Cobalt	7440-48-4	2.80E+00	1/(mg/m3)	9.80E+00	1/(mg/kg-day)	B2	PPRTV	01/15/2002
Copper	7440-50-8	NA	NA	NA	NA	D	NA	NA
Iron	7439-89-6	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	NA	NA	NA	NA	D	NA	NA
Mercury	7439-97-6	NA	NA	NA	NA	D	NA	NA
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	NA	NA	NA	NA	D	NA	NA
Aroclor 1248	12672-29-6	5.71E-01	1/(mg/m3)	2.00E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Aroclor 1254	11097-69-1	5.71E-01	1/(mg/m3)	2.00E+00	1/(mg/kg-day)	B2	IRIS	10/22/2007
Chloroform	67-66-3	2.31E-02	1/(mg/m3)	8.10E-02	1/(mg/kg-day)	B2	IRIS	10/22/2007
4-Methyl-2-Pentanone	108-10-1	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	110-82-7	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	8.86E-01	1/(mg/m3)	3.10E+00	1/(mg/kg-day)	B2	NCEA, Region III	10/11/2007
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD TEQ	1746-01-6	4.29E+04	1/(mg/m3)	1.50E+05	1/(mg/kg-day)	B2	HEAST	07/31/1997

Notes:

CSF = Cancer Slope Factor
mg/(kg-d) = Milligrams Per Kilogram Day
USEPA = U.S. Environmental Protection Agency
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available
(1) = Chromium VI toxicity data used

Cancer Guideline Description:
A = Human carcinogen
B1 = Probable human carcinogen - indicates that limited human data are available.
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C = Possible human carcinogen
D = Not classifiable as a human carcinogen

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III and VDEQ.
For IRIS values, the date of the IRIS search is provided.
For NCEA, Region III values, the date of the Region III RBC Table is provided.
For PPRTV values, the date of the paper is provided.
For HEAST values, the date of the HEAST Table is provided.

TABLE E.2-7.1.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Soil	Soil	Ingestion	Aluminum	2.16E+04	mg/kg	1.51E-03	mg/kg-day	--	--	--	4.24E-03	mg/kg-day	1.00E+00	mg/kg-day	4.E-03
				Antimony	1.19E+01	mg/kg	8.34E-07	mg/kg-day	--	--	--	2.34E-06	mg/kg-day	4.00E-04	mg/kg-day	6.E-03
				Arsenic	1.42E+01	mg/kg	9.95E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	1.E-06	2.79E-06	mg/kg-day	3.00E-04	mg/kg-day	9.E-03
				Chromium	3.10E+01	mg/kg	2.16E-06	mg/kg-day	--	--	--	6.06E-06	mg/kg-day	3.00E-03	mg/kg-day	2.E-03
				Cobalt	9.24E+00	mg/kg	6.46E-07	mg/kg-day	--	--	--	1.81E-06	mg/kg-day	2.00E-02	mg/kg-day	9.E-05
				Iron	2.59E+04	mg/kg	1.81E-03	mg/kg-day	--	--	--	5.06E-03	mg/kg-day	7.00E-01	mg/kg-day	7.E-03
				Manganese	4.61E+02	mg/kg	3.22E-05	mg/kg-day	--	--	--	9.03E-05	mg/kg-day	2.00E-02	mg/kg-day	5.E-03
				Thallium	4.85E-01	mg/kg	3.39E-08	mg/kg-day	--	--	--	9.49E-08	mg/kg-day	7.00E-05	mg/kg-day	1.E-03
				Vanadium	5.49E+01	mg/kg	3.84E-06	mg/kg-day	--	--	--	1.08E-05	mg/kg-day	1.00E-03	mg/kg-day	1.E-02
				Aroclor 1248	4.50E-01	mg/kg	3.15E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	6.E-08	8.81E-08	mg/kg-day	--	--	--
				Aroclor 1254	3.85E-01	mg/kg	2.69E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-08	7.53E-08	mg/kg-day	2.00E-05	mg/kg-day	4.E-03
				4-Methyl-2-Pentanone	1.43E-02	mg/kg	9.99E-10	mg/kg-day	--	--	--	2.80E-09	mg/kg-day	--	--	--
				Cyclohexane	4.00E-03	mg/kg	2.80E-10	mg/kg-day	--	--	--	7.83E-10	mg/kg-day	--	--	--
				Methylcyclohexane	2.70E-02	mg/kg	1.89E-09	mg/kg-day	--	--	--	5.28E-09	mg/kg-day	--	--	--
			Exp. Route Total								2.E-06					5.E-02
			Dermal Absorption	Aluminum	2.16E+04	mg/kg	4.99E-05	mg/kg-day	--	--	--	1.40E-04	mg/kg-day	1.00E+00	mg/kg-day	1.E-04
				Antimony	1.19E+01	mg/kg	2.75E-08	mg/kg-day	--	--	--	7.71E-08	mg/kg-day	6.00E-05	mg/kg-day	1.E-03
				Arsenic	1.42E+01	mg/kg	9.85E-08	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	1.E-07	2.76E-07	mg/kg-day	3.00E-04	mg/kg-day	9.E-04
				Chromium	3.10E+01	mg/kg	7.14E-08	mg/kg-day	--	--	--	2.00E-07	mg/kg-day	7.50E-05	mg/kg-day	3.E-03
				Cobalt	9.24E+00	mg/kg	2.13E-08	mg/kg-day	--	--	--	5.97E-08	mg/kg-day	2.00E-02	mg/kg-day	3.E-06
				Iron	2.59E+04	mg/kg	5.96E-05	mg/kg-day	--	--	--	1.67E-04	mg/kg-day	7.00E-01	mg/kg-day	2.E-04
				Manganese	4.61E+02	mg/kg	1.06E-06	mg/kg-day	--	--	--	2.98E-06	mg/kg-day	8.00E-04	mg/kg-day	4.E-03
				Thallium	4.85E-01	mg/kg	1.12E-09	mg/kg-day	--	--	--	3.13E-09	mg/kg-day	7.00E-05	mg/kg-day	4.E-05
				Vanadium	5.49E+01	mg/kg	1.27E-07	mg/kg-day	--	--	--	3.55E-07	mg/kg-day	2.60E-05	mg/kg-day	1.E-02
				Aroclor 1248	4.50E-01	mg/kg	1.45E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-08	4.07E-08	mg/kg-day	--	--	--
				Aroclor 1254	3.85E-01	mg/kg	1.24E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-08	3.48E-08	mg/kg-day	2.00E-05	mg/kg-day	2.E-03
				4-Methyl-2-Pentanone	1.43E-02	mg/kg	9.89E-11	mg/kg-day	--	--	--	2.77E-10	mg/kg-day	--	--	--
				Cyclohexane	4.00E-03	mg/kg	4.61E-13	mg/kg-day	--	--	--	1.29E-12	mg/kg-day	--	--	--
				Methylcyclohexane	2.70E-02	mg/kg	1.87E-10	mg/kg-day	--	--	--	5.23E-10	mg/kg-day	--	--	--
			Exp. Route Total								2.E-07					2.E-02
		Exposure Point Total									2.E-06					7.E-02
	Exposure Medium Total										2.E-06					7.E-02

TABLE E.2-7.1.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	2.16E+04	mg/kg	1.39E-07	mg/kg-day	--	--	--	3.89E-07	mg/kg-day	1.00E-03	mg/kg-day	4.E-04
				Antimony	1.19E+01	mg/kg	7.67E-11	mg/kg-day	--	--	--	2.15E-10	mg/kg-day	--	--	--
				Arsenic	1.42E+01	mg/kg	9.14E-11	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	1.E-09	2.56E-10	mg/kg-day	--	--	--
				Chromium	3.10E+01	mg/kg	1.99E-10	mg/kg-day	4.10E+01	mg/kg-day $^{-1}$	8.E-09	5.56E-10	mg/kg-day	2.90E-05	mg/kg-day	2.E-05
				Cobalt	9.24E+00	mg/kg	5.93E-11	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	6.E-10	1.66E-10	mg/kg-day	5.70E-06	mg/kg-day	3.E-05
				Iron	2.59E+04	mg/kg	1.66E-07	mg/kg-day	--	--	--	4.65E-07	mg/kg-day	--	--	--
				Manganese	4.61E+02	mg/kg	2.96E-09	mg/kg-day	--	--	--	8.29E-09	mg/kg-day	1.43E-05	mg/kg-day	6.E-04
				Thallium	4.85E-01	mg/kg	3.11E-12	mg/kg-day	--	--	--	8.72E-12	mg/kg-day	--	--	--
				Vanadium	5.49E+01	mg/kg	3.53E-10	mg/kg-day	--	--	--	9.88E-10	mg/kg-day	--	--	--
				Aroclor 1248	4.50E-01	mg/kg	2.89E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	6.E-12	8.09E-12	mg/kg-day	--	--	--
				Aroclor 1254	3.85E-01	mg/kg	2.47E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-12	6.92E-12	mg/kg-day	--	--	--
				4-Methyl-2-Pentanone	1.43E-02	mg/kg	9.18E-14	mg/kg-day	--	--	--	2.57E-13	mg/kg-day	8.60E-01	mg/kg-day	3.E-13
				Cyclohexane	4.00E-03	mg/kg	2.57E-14	mg/kg-day	--	--	--	7.19E-14	mg/kg-day	1.70E+00	mg/kg-day	4.E-14
				Methylcyclohexane	2.70E-02	mg/kg	1.73E-13	mg/kg-day	--	--	--	4.85E-13	mg/kg-day	8.60E-01	mg/kg-day	6.E-13
			Exp. Route Total								1.E-08					1.E-03
		Exposure Point Total									1.E-08					1.E-03
		Outdoor Vapors	Inhalation	4-Methyl-2-Pentanone	0.0143	mg/kg	8.17E-09	mg/kg-day	--	--	--	2.29E-08	mg/kg-day	8.60E-01	mg/kg-day	3.E-08
				Cyclohexane	0.004	mg/kg	1.44E-08	mg/kg-day	--	--	--	4.02E-08	mg/kg-day	1.70E+00	mg/kg-day	2.E-08
				Methylcyclohexane	0.027	mg/kg	1.07E-07	mg/kg-day	--	--	--	3.00E-07	mg/kg-day	8.60E-01	mg/kg-day	3.E-07
			Exp. Route Total								--					4.E-07
		Exposure Point Total									--					4.E-07
	Exposure Medium Total										1.E-08					1.E-03
Soil Total											2.E-06					7.E-02
											Total of Receptor Risks Across All Media					
											2.E-06	Total of Receptor Hazards Across All Media				7.E-02

TABLE E.2-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	3.58E+04	mg/kg	2.50E-03	mg/kg-day	--	--	--	7.00E-03	mg/kg-day	1.00E+00	mg/kg-day	7.E-03
				Antimony	1.76E+00	mg/kg	1.23E-07	mg/kg-day	--	--	--	3.45E-07	mg/kg-day	4.00E-04	mg/kg-day	9.E-04
				Arsenic	8.77E+00	mg/kg	6.13E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	9.E-07	1.72E-06	mg/kg-day	3.00E-04	mg/kg-day	6.E-03
				Chromium	6.11E+01	mg/kg	4.27E-06	mg/kg-day	--	--	--	1.20E-05	mg/kg-day	3.00E-03	mg/kg-day	4.E-03
				Cobalt	1.08E+01	mg/kg	7.56E-07	mg/kg-day	--	--	--	2.12E-06	mg/kg-day	2.00E-02	mg/kg-day	1.E-04
				Iron	3.98E+04	mg/kg	2.78E-03	mg/kg-day	--	--	--	7.78E-03	mg/kg-day	7.00E-01	mg/kg-day	1.E-02
				Lead	8.65E+01	mg/kg	6.05E-06	mg/kg-day	--	--	--	1.69E-05	mg/kg-day	--	--	--
				Manganese	3.56E+02	mg/kg	2.49E-05	mg/kg-day	--	--	--	6.96E-05	mg/kg-day	2.00E-02	mg/kg-day	3.E-03
				Thallium	3.54E-01	mg/kg	2.47E-08	mg/kg-day	--	--	--	6.93E-08	mg/kg-day	7.00E-05	mg/kg-day	1.E-03
				Vanadium	7.46E+01	mg/kg	5.21E-06	mg/kg-day	--	--	--	1.46E-05	mg/kg-day	1.00E-03	mg/kg-day	1.E-02
				Aroclor 1248	4.50E-01	mg/kg	3.15E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	6.E-08	8.81E-08	mg/kg-day	--	--	--
				Aroclor 1254	1.20E-01	mg/kg	8.39E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-08	2.35E-08	mg/kg-day	2.00E-05	mg/kg-day	1.E-03
				4-Methyl-2-Pentanone	1.11E-02	mg/kg	7.76E-10	mg/kg-day	--	--	--	2.17E-09	mg/kg-day	--	--	--
				Cyclohexane	4.00E-03	mg/kg	2.80E-10	mg/kg-day	--	--	--	7.83E-10	mg/kg-day	--	--	--
				Methylcyclohexane	2.65E-02	mg/kg	1.85E-09	mg/kg-day	--	--	--	5.19E-09	mg/kg-day	--	--	--
				Di-n-octylphalate	1.40E-01	mg/kg	9.78E-09	mg/kg-day	--	--	--	2.74E-08	mg/kg-day	4.00E-02	mg/kg-day	7.E-07
				Benzo(a)pyrene	5.95E-02	mg/kg	4.16E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	3.E-08	1.16E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	2.10E-01	mg/kg	1.47E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.E-07	4.11E-08	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.20E-06	mg/kg	4.33E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	6.E-08	1.21E-12	mg/kg-day	--	--	--
			Exp. Route Total								1.E-06					5.E-02
			Dermal Absorption	Aluminum	3.58E+04	mg/kg	8.25E-05	mg/kg-day	--	--	--	2.31E-04	mg/kg-day	1.00E+00	mg/kg-day	2.E-04
				Antimony	1.76E+00	mg/kg	4.07E-09	mg/kg-day	--	--	--	1.14E-08	mg/kg-day	6.00E-05	mg/kg-day	2.E-04
				Arsenic	8.77E+00	mg/kg	6.07E-08	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	9.E-08	1.70E-07	mg/kg-day	3.00E-04	mg/kg-day	6.E-04
				Chromium	6.11E+01	mg/kg	1.41E-07	mg/kg-day	--	--	--	3.95E-07	mg/kg-day	7.50E-05	mg/kg-day	5.E-03
				Cobalt	1.08E+01	mg/kg	2.49E-08	mg/kg-day	--	--	--	6.98E-08	mg/kg-day	2.00E-02	mg/kg-day	3.E-06
				Iron	3.98E+04	mg/kg	9.17E-05	mg/kg-day	--	--	--	2.57E-04	mg/kg-day	7.00E-01	mg/kg-day	4.E-04
				Lead	8.65E+01	mg/kg	2.00E-07	mg/kg-day	--	--	--	5.59E-07	mg/kg-day	--	--	--
				Manganese	3.56E+02	mg/kg	8.20E-07	mg/kg-day	--	--	--	2.30E-06	mg/kg-day	8.00E-04	mg/kg-day	3.E-03
				Thallium	3.54E-01	mg/kg	8.16E-10	mg/kg-day	--	--	--	2.29E-09	mg/kg-day	7.00E-05	mg/kg-day	3.E-05
				Vanadium	7.46E+01	mg/kg	1.72E-07	mg/kg-day	--	--	--	4.82E-07	mg/kg-day	2.60E-05	mg/kg-day	2.E-02
				Aroclor 1248	4.50E-01	mg/kg	1.45E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-08	4.07E-08	mg/kg-day	--	--	--
				Aroclor 1254	1.20E-01	mg/kg	3.87E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	8.E-09	1.08E-08	mg/kg-day	2.00E-05	mg/kg-day	5.E-04
				4-Methyl-2-Pentanone	1.11E-02	mg/kg	7.69E-11	mg/kg-day	--	--	--	2.15E-10	mg/kg-day	--	--	--
				Cyclohexane	4.00E-03	mg/kg	4.61E-13	mg/kg-day	--	--	--	1.29E-12	mg/kg-day	--	--	--
				Methylcyclohexane	2.65E-02	mg/kg	1.83E-10	mg/kg-day	--	--	--	5.13E-10	mg/kg-day	--	--	--
				Di-n-octylphalate	1.40E-01	mg/kg	3.23E-09	mg/kg-day	--	--	--	9.04E-09	mg/kg-day	4.00E-02	mg/kg-day	2.E-07
				Benzo(a)pyrene	5.95E-02	mg/kg	1.78E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.E-08	5.00E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	2.10E-01	mg/kg	6.30E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	5.E-08	1.76E-08	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.20E-06	mg/kg	4.29E-14	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	6.E-09	1.20E-13	mg/kg-day	--	--	--
			Exp. Route Total								2.E-07					3.E-02
		Exposure Point Total									1.E-06					8.E-02
	Exposure Medium Total										1.E-06					8.E-02

TABLE E.2-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	3.58E+04	mg/kg	2.30E-07	mg/kg-day	--	--	--	6.43E-07	mg/kg-day	1.00E-03	mg/kg-day	6.E-04
				Antimony	1.76E+00	mg/kg	1.13E-11	mg/kg-day	--	--	--	3.17E-11	mg/kg-day	--	--	--
				Arsenic	8.77E+00	mg/kg	5.63E-11	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	8.E-10	1.58E-10	mg/kg-day	--	--	--
				Chromium	6.11E+01	mg/kg	3.92E-10	mg/kg-day	4.10E+01	mg/kg-day $^{-1}$	2.E-08	1.10E-09	mg/kg-day	2.90E-05	mg/kg-day	4.E-05
				Cobalt	1.08E+01	mg/kg	6.94E-11	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	7.E-10	1.94E-10	mg/kg-day	5.70E-06	mg/kg-day	3.E-05
				Iron	3.98E+04	mg/kg	2.55E-07	mg/kg-day	--	--	--	7.15E-07	mg/kg-day	--	--	--
				Lead	8.65E+01	mg/kg	5.56E-10	mg/kg-day	--	--	--	1.56E-09	mg/kg-day	--	--	--
				Manganese	3.56E+02	mg/kg	2.28E-09	mg/kg-day	--	--	--	6.39E-09	mg/kg-day	1.43E-05	mg/kg-day	4.E-04
				Thallium	3.54E-01	mg/kg	2.27E-12	mg/kg-day	--	--	--	6.36E-12	mg/kg-day	--	--	--
				Vanadium	7.46E+01	mg/kg	4.79E-10	mg/kg-day	--	--	--	1.34E-09	mg/kg-day	--	--	--
				Aroclor 1248	4.50E-01	mg/kg	2.89E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	6.E-12	8.09E-12	mg/kg-day	--	--	--
				Aroclor 1254	1.20E-01	mg/kg	7.70E-13	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-12	2.16E-12	mg/kg-day	--	--	--
				4-Methyl-2-Pentanone	1.11E-02	mg/kg	7.13E-14	mg/kg-day	--	--	--	2.00E-13	mg/kg-day	8.60E-01	mg/kg-day	2.E-13
				Cyclohexane	4.00E-03	mg/kg	2.57E-14	mg/kg-day	--	--	--	7.19E-14	mg/kg-day	1.70E+00	mg/kg-day	4.E-14
				Methylcyclohexane	2.65E-02	mg/kg	1.70E-13	mg/kg-day	--	--	--	4.76E-13	mg/kg-day	8.60E-01	mg/kg-day	6.E-13
				Di-n-octylphalate	1.40E-01	mg/kg	8.99E-13	mg/kg-day	--	--	--	2.52E-12	mg/kg-day	--	--	--
				Benzo(a)pyrene	5.95E-02	mg/kg	3.82E-13	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	1.E-12	1.07E-12	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	2.10E-01	mg/kg	1.35E-12	mg/kg-day	--	--	--	3.77E-12	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.20E-06	mg/kg	3.98E-17	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	6.E-12	1.11E-16	mg/kg-day	--	--	--
			Exp. Route Total								2.E-08					1.E-03
		Exposure Point Total									2.E-08					1.E-03
		Outdoor Vapors	Inhalation	4-Methyl-2-Pentanone	0.01111	mg/kg	6.35E-09	mg/kg-day	--	--	--	1.78E-08	mg/kg-day	8.60E-01	mg/kg-day	2.E-08
				Cyclohexane	0.004	mg/kg	1.44E-08	mg/kg-day	--	--	--	4.02E-08	mg/kg-day	1.70E+00	mg/kg-day	2.E-08
				Methylcyclohexane	0.0265	mg/kg	1.05E-07	mg/kg-day	--	--	--	2.95E-07	mg/kg-day	8.60E-01	mg/kg-day	3.E-07
			Exp. Route Total								--					4.E-07
		Exposure Point Total									--					4.E-07
	Exposure Medium Total										2.E-08					1.E-03
Soil Total											1.E-06					8.E-02
										Total of Receptor Risks Across All Media	1.E-06	Total of Receptor Hazards Across All Media				8.E-02

TABLE E.2-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	35775	mg/kg	6.25E-03	mg/kg-day	--	--	--	1.75E-02	mg/kg-day	1.00E+00	mg/kg-day	2.E-02
				Antimony	1.764	mg/kg	3.08E-07	mg/kg-day	--	--	--	8.63E-07	mg/kg-day	4.00E-04	mg/kg-day	2.E-03
				Arsenic	8.766	mg/kg	1.53E-06	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	2.E-06	4.29E-06	mg/kg-day	3.00E-04	mg/kg-day	1.E-02
				Chromium	61.1	mg/kg	1.07E-05	mg/kg-day	--	--	--	2.99E-05	mg/kg-day	3.00E-03	mg/kg-day	1.E-02
				Cobalt	10.81	mg/kg	1.89E-06	mg/kg-day	--	--	--	5.29E-06	mg/kg-day	2.00E-02	mg/kg-day	3.E-04
				Iron	39769	mg/kg	6.95E-03	mg/kg-day	--	--	--	1.95E-02	mg/kg-day	7.00E-01	mg/kg-day	3.E-02
				Manganese	355.6	mg/kg	6.21E-05	mg/kg-day	--	--	--	1.74E-04	mg/kg-day	2.00E-02	mg/kg-day	9.E-03
				Thallium	0.354	mg/kg	6.19E-08	mg/kg-day	--	--	--	1.73E-07	mg/kg-day	7.00E-05	mg/kg-day	2.E-03
				Vanadium	74.59	mg/kg	1.30E-05	mg/kg-day	--	--	--	3.65E-05	mg/kg-day	1.00E-03	mg/kg-day	4.E-02
				Aroclor 1248	0.45	mg/kg	7.86E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-07	2.20E-07	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	2.10E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-08	5.87E-08	mg/kg-day	2.00E-05	mg/kg-day	3.E-03
				4-Methyl-2-Pentanone	0.01111	mg/kg	1.94E-09	mg/kg-day	--	--	--	5.44E-09	mg/kg-day	--	--	--
				Cyclohexane	0.004	mg/kg	6.99E-10	mg/kg-day	--	--	--	1.96E-09	mg/kg-day	--	--	--
				Methylcyclohexane	0.0265	mg/kg	4.63E-09	mg/kg-day	--	--	--	1.30E-08	mg/kg-day	--	--	--
				Di-n-octylphalate	0.14	mg/kg	2.45E-08	mg/kg-day	--	--	--	6.85E-08	mg/kg-day	4.00E-02	mg/kg-day	2.E-06
				Benzo(a)pyrene	0.0595	mg/kg	1.04E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	8.E-08	2.91E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.21	mg/kg	3.67E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	3.E-07	1.03E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	0.0000062	mg/kg	1.08E-12	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-07	3.03E-12	mg/kg-day	--	--	--
			Exp. Route Total								3.E-06					1.E-01
			Dermal Absorption	Aluminum	35775	mg/kg	4.13E-04	mg/kg-day	--	--	--	1.16E-03	mg/kg-day	1.00E+00	mg/kg-day	1.E-03
				Antimony	1.764	mg/kg	2.03E-08	mg/kg-day	--	--	--	5.70E-08	mg/kg-day	6.00E-05	mg/kg-day	9.E-04
				Arsenic	8.766	mg/kg	3.03E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	5.E-07	8.49E-07	mg/kg-day	3.00E-04	mg/kg-day	3.E-03
				Chromium	61.1	mg/kg	7.05E-07	mg/kg-day	--	--	--	1.97E-06	mg/kg-day	7.50E-05	mg/kg-day	3.E-02
				Cobalt	10.81	mg/kg	1.25E-07	mg/kg-day	--	--	--	3.49E-07	mg/kg-day	2.00E-02	mg/kg-day	2.E-05
				Iron	39769	mg/kg	4.59E-04	mg/kg-day	--	--	--	1.28E-03	mg/kg-day	7.00E-01	mg/kg-day	2.E-03
				Manganese	355.6	mg/kg	4.10E-06	mg/kg-day	--	--	--	1.15E-05	mg/kg-day	8.00E-04	mg/kg-day	1.E-02
				Thallium	0.354	mg/kg	4.08E-09	mg/kg-day	--	--	--	1.14E-08	mg/kg-day	7.00E-05	mg/kg-day	2.E-04
				Vanadium	74.59	mg/kg	8.60E-07	mg/kg-day	--	--	--	2.41E-06	mg/kg-day	2.60E-05	mg/kg-day	9.E-02
				Aroclor 1248	0.45	mg/kg	7.27E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-07	2.03E-07	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	1.94E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-08	5.42E-08	mg/kg-day	2.00E-05	mg/kg-day	3.E-03
				4-Methyl-2-Pentanone	0.01111	mg/kg	3.84E-10	mg/kg-day	--	--	--	1.08E-09	mg/kg-day	--	--	--
				Cyclohexane	0.004	mg/kg	2.31E-12	mg/kg-day	--	--	--	6.46E-12	mg/kg-day	--	--	--
				Methylcyclohexane	0.0265	mg/kg	9.17E-10	mg/kg-day	--	--	--	2.57E-09	mg/kg-day	--	--	--
				Di-n-octylphalate	0.14	mg/kg	1.61E-08	mg/kg-day	--	--	--	4.52E-08	mg/kg-day	4.00E-02	mg/kg-day	1.E-06
				Benzo(a)pyrene	0.0595	mg/kg	8.92E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	7.E-08	2.50E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.21	mg/kg	3.15E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	2.E-07	8.82E-08	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	0.0000062	mg/kg	2.14E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	3.E-08	6.01E-13	mg/kg-day	--	--	--
			Exp. Route Total								1.E-06					1.E-01
		Exposure Point Total									4.E-06					3.E-01
	Exposure Medium Total										4.E-06					3.E-01
	Air	Fugitive Dust	Inhalation	Aluminum	35775	mg/kg	7.66E-07	mg/kg-day	--	--	--	2.14E-06	mg/kg-day	1.00E-03	mg/kg-day	2.E-03
				Antimony	1.764	mg/kg	3.77E-11	mg/kg-day	--	--	--	1.06E-10	mg/kg-day	--	--	--
				Arsenic	8.766	mg/kg	1.88E-10	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	3.E-09	5.25E-10	mg/kg-day	--	--	--
				Chromium	61.1	mg/kg	1.31E-09	mg/kg-day	4.10E+01	mg/kg-day $^{-1}$	5.4.E-08	3.66E-09	mg/kg-day	2.90E-05	mg/kg-day	1.E-04
				Cobalt	10.81	mg/kg	2.31E-10	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	2.E-09	6.48E-10	mg/kg-day	5.70E-06	mg/kg-day	1.E-04
				Iron	39769	mg/kg	8.51E-07	mg/kg-day	--	--	--	2.38E-06	mg/kg-day	--	--	--

TABLE E.2-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air Cont.	Fugitive Dust Cont.		Manganese	355.6	mg/kg	7.61E-09	mg/kg-day	--	--	--	2.13E-08	mg/kg-day	1.43E-05	mg/kg-day	1.E-03
				Thallium	0.354	mg/kg	7.58E-12	mg/kg-day	--	--	--	2.12E-11	mg/kg-day	--	--	--
				Vanadium	74.59	mg/kg	1.60E-09	mg/kg-day	--	--	--	4.47E-09	mg/kg-day	--	--	--
				Aroclor 1248	0.45	mg/kg	9.63E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-11	2.70E-11	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	2.57E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-12	7.19E-12	mg/kg-day	--	--	--
				4-Methyl-2-Pentanone	0.01111	mg/kg	2.38E-13	mg/kg-day	--	--	--	6.66E-13	mg/kg-day	8.60E-01	mg/kg-day	8.E-13
				Cyclohexane	0.004	mg/kg	8.56E-14	mg/kg-day	--	--	--	2.40E-13	mg/kg-day	1.70E+00	mg/kg-day	1.E-13
				Methylcyclohexane	0.0265	mg/kg	5.67E-13	mg/kg-day	--	--	--	1.59E-12	mg/kg-day	8.60E-01	mg/kg-day	2.E-12
				Di-n-octylphalate	0.14	mg/kg	3.00E-12	mg/kg-day	--	--	--	8.39E-12	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0595	mg/kg	1.27E-12	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	4.E-12	3.57E-12	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.21	mg/kg	4.49E-12	mg/kg-day	--	--	--	1.26E-11	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	0.0000062	mg/kg	1.33E-16	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-11	3.72E-16	mg/kg-day	--	--	--
			Exp. Route Total								6.E-08					4.E-03
		Exposure Point Total									6.E-08					4.E-03
		Outdoor Vapors	Inhalation	4-Methyl-2-Pentanone	0.01111	mg/kg	2.12E-08	mg/kg-day	--	--	--	5.93E-08	mg/kg-day	8.60E-01	mg/kg-day	7.E-08
				Cyclohexane	0.004	mg/kg	4.79E-08	mg/kg-day	--	--	--	1.34E-07	mg/kg-day	1.70E+00	mg/kg-day	8.E-08
				Methylcyclohexane	0.0265	mg/kg	3.51E-07	mg/kg-day	--	--	--	9.82E-07	mg/kg-day	8.60E-01	mg/kg-day	1.E-06
			Exp. Route Total								--					1.E-06
		Exposure Point Total									--					1.E-06
		Upward Migration of Vapors from Soil Indoor Air	Inhalation	4-Methyl-2-Pentanone	9.98E-04	mg/m^3	2.79E-05	mg/kg-day	--	--	--	7.81E-05	mg/kg-day	8.60E-01	mg/kg-day	9.E-05
				Cyclohexane	3.61E-02	mg/m^3	1.01E-03	mg/kg-day	--	--	--	2.83E-03	mg/kg-day	1.70E+00	mg/kg-day	2.E-03
				Methylcyclohexane	4.05E-01	mg/m^3	1.13E-02	mg/kg-day	--	--	--	3.17E-02	mg/kg-day	8.60E-01	mg/kg-day	4.E-02
			Exp. Route Total								--					4.E-02
		Exposure Point Total									--					4.E-02
	Exposure Medium Total										6.E-08					4.E-02
Soil Total											4.E-06					3.E-01
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Chloroform	24	ug/L	8.39E-05	mg/kg-day	--	--	--	2.35E-04	mg/kg-day	1.00E-02	mg/kg-day	2.E-02
			Exp. Route Total								--					2.E-02
			Dermal Absorption	Chloroform	24	ug/L	8.93E-07	mg/kg-day	--	--	--	2.50E-06	mg/kg-day	1.00E-02	mg/kg-day	3.E-04
			Exp. Route Total								--					3.E-04
		Exposure Point Total									--					2.E-02
	Exposure Medium Total										--					2.E-02
	Air	Upward Migration of Vapors from Groundwater (Indoor) (1)	Inhalation	Chloroform	1.25E-04	mg/m^3	3.49E-06	mg/kg-day	8.10E-02	mg/kg-day $^{-1}$	3.E-07	9.78E-06	mg/kg-day	1.40E-02	mg/kg-day	7.E-04
			Exp. Route Total								3.E-07					7.E-04
		Exposure Point Total									3.E-07					7.E-04
	Exposure Medium Total										3.E-07					7.E-04
Groundwater Total											3.E-07					2.E-02
										Total of Receptor Risks Across All Media	4.E-06			Total of Receptor Hazards Across All Media		3.E-01

TABLE E.2-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	35775	mg/kg	1.65E-03	mg/kg-day	--	--	--	1.16E-01	mg/kg-day	1.00E+00	mg/kg-day	1.E-01
				Antimony	1.764	mg/kg	8.14E-08	mg/kg-day	--	--	--	5.70E-06	mg/kg-day	2.00E-04	mg/kg-day	3.E-02
				Arsenic	8.766	mg/kg	4.04E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	6.E-07	2.83E-05	mg/kg-day	3.00E-04	mg/kg-day	9.E-02
				Chromium	61.1	mg/kg	2.82E-06	mg/kg-day	--	--	--	1.97E-04	mg/kg-day	2.00E-02	mg/kg-day	1.E-02
				Cobalt	10.81	mg/kg	4.99E-07	mg/kg-day	--	--	--	3.49E-05	mg/kg-day	2.00E-02	mg/kg-day	2.E-03
				Iron	39769	mg/kg	1.83E-03	mg/kg-day	--	--	--	1.28E-01	mg/kg-day	3.00E-01	mg/kg-day	4.E-01
				Manganese	355.6	mg/kg	1.64E-05	mg/kg-day	--	--	--	1.15E-03	mg/kg-day	2.00E-02	mg/kg-day	6.E-02
				Thallium	0.354	mg/kg	1.63E-08	mg/kg-day	--	--	--	1.14E-06	mg/kg-day	7.00E-05	mg/kg-day	2.E-02
				Vanadium	74.59	mg/kg	3.44E-06	mg/kg-day	--	--	--	2.41E-04	mg/kg-day	7.00E-03	mg/kg-day	3.E-02
				Aroclor 1248	0.45	mg/kg	2.08E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-08	1.45E-06	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	5.54E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-08	3.87E-07	mg/kg-day	5.00E-05	mg/kg-day	8.E-03
				4-Methyl-2-Pentanone	0.01111	mg/kg	5.12E-10	mg/kg-day	--	--	--	3.59E-08	mg/kg-day	--	--	--
				Cyclohexane	0.004	mg/kg	1.85E-10	mg/kg-day	--	--	--	1.29E-08	mg/kg-day	--	--	--
				Methylcyclohexane	0.0265	mg/kg	1.22E-09	mg/kg-day	--	--	--	8.56E-08	mg/kg-day	--	--	--
				Di-n-octylphalate	0.14	mg/kg	6.46E-09	mg/kg-day	--	--	--	4.52E-07	mg/kg-day	4.00E-01	mg/kg-day	1.E-06
				Benzo(a)pyrene	0.0595	mg/kg	2.74E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	2.E-08	1.92E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.21	mg/kg	9.69E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	7.E-08	6.78E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	2.86E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	4.E-08	2.00E-11	mg/kg-day	--	--	--
			Exp. Route Total								8.E-07					8.E-01
			Dermal Absorption	Aluminum	35775	mg/kg	4.95E-05	mg/kg-day	--	--	--	3.47E-03	mg/kg-day	1.00E+00	mg/kg-day	3.E-03
				Antimony	1.764	mg/kg	2.44E-09	mg/kg-day	--	--	--	1.71E-07	mg/kg-day	3.00E-05	mg/kg-day	6.E-03
				Arsenic	8.766	mg/kg	3.64E-08	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	5.E-08	2.55E-06	mg/kg-day	3.00E-04	mg/kg-day	8.E-03
				Chromium	61.1	mg/kg	8.46E-08	mg/kg-day	--	--	--	5.92E-06	mg/kg-day	5.00E-04	mg/kg-day	1.E-02
				Cobalt	10.81	mg/kg	1.50E-08	mg/kg-day	--	--	--	1.05E-06	mg/kg-day	2.00E-02	mg/kg-day	5.E-05
				Iron	39769	mg/kg	5.50E-05	mg/kg-day	--	--	--	3.85E-03	mg/kg-day	3.00E-01	mg/kg-day	1.E-02
				Manganese	355.6	mg/kg	4.92E-07	mg/kg-day	--	--	--	3.44E-05	mg/kg-day	8.00E-04	mg/kg-day	4.E-02
				Thallium	0.354	mg/kg	4.90E-10	mg/kg-day	--	--	--	3.43E-08	mg/kg-day	7.00E-05	mg/kg-day	5.E-04
				Vanadium	74.59	mg/kg	1.03E-07	mg/kg-day	--	--	--	7.23E-06	mg/kg-day	1.80E-04	mg/kg-day	4.E-02
				Aroclor 1248	0.45	mg/kg	8.72E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-08	6.10E-07	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	2.32E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-09	1.63E-07	mg/kg-day	5.00E-05	mg/kg-day	3.E-03
				4-Methyl-2-Pentanone	0.01111	mg/kg	4.61E-11	mg/kg-day	--	--	--	3.23E-09	mg/kg-day	--	--	--
				Cyclohexane	0.004	mg/kg	2.77E-13	mg/kg-day	--	--	--	1.94E-11	mg/kg-day	--	--	--
				Methylcyclohexane	0.0265	mg/kg	1.10E-10	mg/kg-day	--	--	--	7.70E-09	mg/kg-day	--	--	--
				Di-n-octylphalate	0.14	mg/kg	1.94E-09	mg/kg-day	--	--	--	1.36E-07	mg/kg-day	4.00E-01	mg/kg-day	3.E-07
				Benzo(a)pyrene	0.0595	mg/kg	1.07E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	8.E-09	7.49E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.21	mg/kg	3.78E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	3.E-08	2.64E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	2.57E-14	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	4.E-09	1.80E-12	mg/kg-day	--	--	--
			Exp. Route Total								1.E-07					1.E-01
		Exposure Point Total									9.E-07					9.E-01
	Exposure Medium Total										9.E-07					9.E-01

TABLE E.2-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	35775	mg/kg	4.24E-05	mg/kg-day	--	--	--	2.97E-03	mg/kg-day	1.40E-03	mg/kg-day	2.E+00
				Antimony	1.764	mg/kg	2.09E-09	mg/kg-day	--	--	--	1.46E-07	mg/kg-day	1.10E-04	mg/kg-day	1.E-03
				Arsenic	8.766	mg/kg	1.04E-08	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	2.E-07	7.28E-07	mg/kg-day	--	--	--
				Chromium	61.1	mg/kg	7.25E-08	mg/kg-day	4.10E+01	mg/kg-day $^{-1}$	3.E-06	5.07E-06	mg/kg-day	2.90E-05	mg/kg-day	2.E-01
				Cobalt	10.81	mg/kg	1.28E-08	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	1.E-07	8.98E-07	mg/kg-day	5.70E-06	mg/kg-day	2.E-01
				Iron	39769	mg/kg	4.72E-05	mg/kg-day	--	--	--	3.30E-03	mg/kg-day	--	--	--
				Manganese	355.6	mg/kg	4.22E-07	mg/kg-day	--	--	--	2.95E-05	mg/kg-day	1.43E-05	mg/kg-day	2.E+00
				Thallium	0.354	mg/kg	4.20E-10	mg/kg-day	--	--	--	2.94E-08	mg/kg-day	--	--	--
				Vanadium	74.59	mg/kg	8.85E-08	mg/kg-day	--	--	--	6.19E-06	mg/kg-day	--	--	--
				Aroclor 1248	0.45	mg/kg	5.34E-10	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-09	3.74E-08	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	1.42E-10	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-10	9.96E-09	mg/kg-day	--	--	--
				4-Methyl-2-Pentanone	0.01111	mg/kg	1.32E-11	mg/kg-day	--	--	--	9.22E-10	mg/kg-day	8.60E-01	mg/kg-day	1.E-09
				Cyclohexane	0.004	mg/kg	4.74E-12	mg/kg-day	--	--	--	3.32E-10	mg/kg-day	1.70E+00	mg/kg-day	2.E-10
				Methylcyclohexane	0.0265	mg/kg	3.14E-11	mg/kg-day	--	--	--	2.20E-09	mg/kg-day	8.60E-01	mg/kg-day	3.E-09
				Di-n-octylphalate	0.14	mg/kg	1.66E-10	mg/kg-day	--	--	--	1.16E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0595	mg/kg	7.06E-11	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	2.E-10	4.94E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene	0.21	mg/kg	2.49E-10	mg/kg-day	--	--	--	1.74E-08	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	7.35E-15	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.E-09	5.15E-13	mg/kg-day	--	--	--
			Exp. Route Total								3.E-06					5.E+00
		Exposure Point Total									3.E-06					5.E+00
		Outdoor Vapors	Inhalation	4-Methyl-2-Pentanone	0.01111	mg/kg	7.75E-09	mg/kg-day	--	--	--	5.43E-07	mg/kg-day	8.60E-01	mg/kg-day	6.E-07
				Cyclohexane	0.004	mg/kg	1.75E-08	mg/kg-day	--	--	--	1.23E-06	mg/kg-day	1.70E+00	mg/kg-day	7.E-07
				Methylcyclohexane	0.0265	mg/kg	1.28E-07	mg/kg-day	--	--	--	8.99E-06	mg/kg-day	8.60E-01	mg/kg-day	1.E-05
			Exp. Route Total								--					1.E-05
		Exposure Point Total									--					1.E-05
	Exposure Medium Total										3.E-06					5.E+00
Soil Total											4.E-06					5.E+00
Groundwater	Air	Upward Migration of Vapors from Groundwater Trench Vapors (1)	Inhalation	Chloroform	3.33E-05	mg/m^3	4.65E-08	mg/kg-day	8.10E-02	mg/kg-day $^{-1}$	4.E-09	3.25E-06	mg/kg-day	1.40E-02	mg/kg-day	2.E-04
			Exp. Route Total								4.E-09					2.E-04
		Exposure Point Total									4.E-09					2.E-04
	Exposure Medium Total										4.E-09					2.E-04
Groundwater Total											4.E-09					2.E-04
										Total of Receptor Risks Across All Media	4.E-06			Total of Receptor Hazards Across All Media		5.E+00

TABLE E.2-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	35775	mg/kg	1.68E-02	mg/kg-day	--	--	--	4.90E-02	mg/kg-day	1.00E+00	mg/kg-day	5.E-02
				Antimony	1.764	mg/kg	8.28E-07	mg/kg-day	--	--	--	2.42E-06	mg/kg-day	4.00E-04	mg/kg-day	6.E-03
				Arsenic	8.766	mg/kg	4.12E-06	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	6.E-06	1.20E-05	mg/kg-day	3.00E-04	mg/kg-day	4.E-02
				Chromium	61.1	mg/kg	2.87E-05	mg/kg-day	--	--	--	8.37E-05	mg/kg-day	3.00E-03	mg/kg-day	3.E-02
				Cobalt	10.81	mg/kg	5.08E-06	mg/kg-day	--	--	--	1.48E-05	mg/kg-day	2.00E-02	mg/kg-day	7.E-04
				Iron	39769	mg/kg	1.87E-02	mg/kg-day	--	--	--	5.45E-02	mg/kg-day	7.00E-01	mg/kg-day	8.E-02
				Manganese	355.6	mg/kg	1.67E-04	mg/kg-day	--	--	--	4.87E-04	mg/kg-day	2.00E-02	mg/kg-day	2.E-02
				Thallium	0.354	mg/kg	1.66E-07	mg/kg-day	--	--	--	4.85E-07	mg/kg-day	7.00E-05	mg/kg-day	7.E-03
				Vanadium	74.59	mg/kg	3.50E-05	mg/kg-day	--	--	--	1.02E-04	mg/kg-day	1.00E-03	mg/kg-day	1.E-01
				Aroclor 1248	0.45	mg/kg	2.11E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-07	6.16E-07	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	5.64E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-07	1.64E-07	mg/kg-day	2.00E-05	mg/kg-day	8.E-03
				4-Methyl-2-Pentanone	0.01111	mg/kg	5.22E-09	mg/kg-day	--	--	--	1.52E-08	mg/kg-day	--	--	--
				Cyclohexane	0.004	mg/kg	1.88E-09	mg/kg-day	--	--	--	5.48E-09	mg/kg-day	--	--	--
				Methylcyclohexane	0.0265	mg/kg	1.24E-08	mg/kg-day	--	--	--	3.63E-08	mg/kg-day	--	--	--
				Di-n-octylphalate	0.14	mg/kg	6.58E-08	mg/kg-day	--	--	--	1.92E-07	mg/kg-day	4.00E-02	mg/kg-day	5.E-06
				Benzo(a)pyrene*	0.0595	mg/kg	2.79E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	4.E-07	8.15E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.21	mg/kg	9.86E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.E-06	2.88E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	2.91E-12	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	4.E-07	8.49E-12	mg/kg-day	--	--	--
			Exp. Route Total								9.E-06					3.E-01
			Dermal Absorption	Aluminum	35775	mg/kg	6.70E-04	mg/kg-day	--	--	--	1.96E-03	mg/kg-day	1.00E+00	mg/kg-day	2.E-03
				Antimony	1.764	mg/kg	3.31E-08	mg/kg-day	--	--	--	9.64E-08	mg/kg-day	6.00E-05	mg/kg-day	2.E-03
				Arsenic	8.766	mg/kg	4.93E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	7.E-07	1.44E-06	mg/kg-day	3.00E-04	mg/kg-day	5.E-03
				Chromium	61.1	mg/kg	1.14E-06	mg/kg-day	--	--	--	3.34E-06	mg/kg-day	7.50E-05	mg/kg-day	4.E-02
				Cobalt	10.81	mg/kg	2.03E-07	mg/kg-day	--	--	--	5.91E-07	mg/kg-day	2.00E-02	mg/kg-day	3.E-05
				Iron	39769	mg/kg	7.45E-04	mg/kg-day	--	--	--	2.17E-03	mg/kg-day	7.00E-01	mg/kg-day	3.E-03
				Manganese	355.6	mg/kg	6.66E-06	mg/kg-day	--	--	--	1.94E-05	mg/kg-day	8.00E-04	mg/kg-day	2.E-02
				Thallium	0.354	mg/kg	6.63E-09	mg/kg-day	--	--	--	1.93E-08	mg/kg-day	7.00E-05	mg/kg-day	3.E-04
				Vanadium	74.59	mg/kg	1.40E-06	mg/kg-day	--	--	--	4.08E-06	mg/kg-day	2.60E-05	mg/kg-day	2.E-01
				Aroclor 1248	0.45	mg/kg	1.18E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-07	3.44E-07	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	3.15E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	6.E-08	9.18E-08	mg/kg-day	2.00E-05	mg/kg-day	5.E-03
				4-Methyl-2-Pentanone	0.01111	mg/kg	6.25E-10	mg/kg-day	--	--	--	1.82E-09	mg/kg-day	--	--	--
				Cyclohexane	0.004	mg/kg	3.75E-12	mg/kg-day	--	--	--	1.09E-11	mg/kg-day	--	--	--
				Methylcyclohexane	0.0265	mg/kg	1.49E-09	mg/kg-day	--	--	--	4.35E-09	mg/kg-day	--	--	--
				Di-n-octylphalate	0.14	mg/kg	2.62E-08	mg/kg-day	--	--	--	7.65E-08	mg/kg-day	4.00E-02	mg/kg-day	2.E-06
				Benzo(a)pyrene*	0.0595	mg/kg	1.45E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	2.E-07	4.23E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.21	mg/kg	5.12E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	7.E-07	1.49E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	3.49E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	5.E-08	1.02E-12	mg/kg-day	--	--	--
			Exp. Route Total								2.E-06					2.E-01
		Exposure Point Total									1.E-05					6.E-01
	Exposure Medium Total										1.E-05					6.E-01

TABLE E.2-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	35775	mg/kg	2.14E-07	mg/kg-day	--	--	--	6.23E-07	mg/kg-day	1.00E-03	mg/kg-day	6.E-04
				Antimony	1.764	mg/kg	1.05E-11	mg/kg-day	--	--	--	3.07E-11	mg/kg-day	--	--	--
				Arsenic	8.766	mg/kg	5.23E-11	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	8.E-10	1.53E-10	mg/kg-day	--	--	--
				Chromium	61.1	mg/kg	3.65E-10	mg/kg-day	4.10E+01	mg/kg-day $^{-1}$	1.E-08	1.06E-09	mg/kg-day	2.90E-05	mg/kg-day	4.E-05
				Cobalt	10.81	mg/kg	6.45E-11	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	6.E-10	1.88E-10	mg/kg-day	5.70E-06	mg/kg-day	3.E-05
				Iron	39769	mg/kg	2.37E-07	mg/kg-day	--	--	--	6.92E-07	mg/kg-day	--	--	--
				Manganese	355.6	mg/kg	2.12E-09	mg/kg-day	--	--	--	6.19E-09	mg/kg-day	1.43E-05	mg/kg-day	4.E-04
				Thallium	0.354	mg/kg	2.11E-12	mg/kg-day	--	--	--	6.16E-12	mg/kg-day	--	--	--
				Vanadium	74.59	mg/kg	4.45E-10	mg/kg-day	--	--	--	1.30E-09	mg/kg-day	--	--	--
				Aroclor 1248	0.45	mg/kg	2.69E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-12	7.83E-12	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	7.16E-13	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-12	2.09E-12	mg/kg-day	--	--	--
				4-Methyl-2-Pentanone	0.01111	mg/kg	6.63E-14	mg/kg-day	--	--	--	1.93E-13	mg/kg-day	8.60E-01	mg/kg-day	2.E-13
				Cyclohexane	0.004	mg/kg	2.39E-14	mg/kg-day	--	--	--	6.96E-14	mg/kg-day	1.70E+00	mg/kg-day	4.E-14
				Methylcyclohexane	0.0265	mg/kg	1.58E-13	mg/kg-day	--	--	--	4.61E-13	mg/kg-day	8.60E-01	mg/kg-day	5.E-13
				Di-n-octylphalate	0.14	mg/kg	8.36E-13	mg/kg-day	--	--	--	2.44E-12	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0595	mg/kg	3.55E-13	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	2.E-12	1.04E-12	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.21	mg/kg	1.25E-12	mg/kg-day	--	--	--	3.66E-12	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	3.70E-17	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	6.E-12	1.08E-16	mg/kg-day	--	--	--
			Exp. Route Total								2.E-08					1.E-03
		Exposure Point Total									2.E-08					1.E-03
		Outdoor Vapors	Inhalation	4-Methyl-2-Pentanone	0.01111	mg/kg	6.03E-09	mg/kg-day	--	--	--	1.76E-08	mg/kg-day	8.60E-01	mg/kg-day	2.E-08
				Cyclohexane	0.004	mg/kg	1.36E-08	mg/kg-day	--	--	--	3.98E-08	mg/kg-day	1.70E+00	mg/kg-day	2.E-08
				Methylcyclohexane	0.0265	mg/kg	9.99E-08	mg/kg-day	--	--	--	2.91E-07	mg/kg-day	8.60E-01	mg/kg-day	3.E-07
			Exp. Route Total								--					4.E-07
		Exposure Point Total									--					4.E-07
		Upward Migration of Vapors from Soil Indoor Air	Inhalation	4-Methyl-2-Pentanone	9.98E-04	mg/m^3	6.38E-05	mg/kg-day	--	--	--	1.86E-04	mg/kg-day	8.60E-01	mg/kg-day	2.E-04
				Cyclohexane	3.61E-02	mg/m^3	2.31E-03	mg/kg-day	--	--	--	6.73E-03	mg/kg-day	1.70E+00	mg/kg-day	4.E-03
				Methylcyclohexane	4.05E-01	mg/m^3	2.59E-02	mg/kg-day	--	--	--	7.55E-02	mg/kg-day	8.60E-01	mg/kg-day	9.E-02
			Exp. Route Total								--					9.E-02
		Exposure Point Total									--					9.E-02
	Exposure Medium Total										2.E-08					9.E-02
Soil Total											1.E-05					7.E-01
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Chloroform	24	ug/L	2.25E-04	mg/kg-day	--	--	--	6.58E-04	mg/kg-day	1.00E-02	mg/kg-day	7.E-02
			Exp. Route Total								--					7.E-02
			Dermal Absorption	Chloroform	24	ug/L	2.06E-05	mg/kg-day	--	--	--	6.00E-05	mg/kg-day	1.00E-02	mg/kg-day	6.E-03
			Exp. Route Total								--					6.E-03
		Exposure Point Total									--					7.E-02
	Exposure Medium Total										--					7.E-02

TABLE E.2-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
	Air	Upward Migration of Vapors from Groundwater (Indoor) (1)	Inhalation	Chloroform	1.25E-04	mg/m^3	7.99E-06	mg/kg-day	8.10E-02	$mg/kg\text{-}day^{-1}$	6.E-07	2.33E-05	mg/kg-day	1.40E-02	mg/kg-day	2.E-03
			Exp. Route Total								6.E-07					2.E-03
		Exposure Point Total									6.E-07					2.E-03
		Vapors While Showering with Groundwater (2)	Inhalation	Chloroform	1.91E+00	mg/m^3	1.94E-03	mg/kg-day	8.10E-02	$mg/kg\text{-}day^{-1}$	2.E-04	4.53E-03	mg/kg-day	1.40E-02	mg/kg-day	3.E-01
			Exp. Route Total								2.E-04					3.E-01
		Exposure Point Total									2.E-04					3.E-01
	Exposure Medium Total										2.E-04					3.E-01
Groundwater Total											2.E-04					4.E-01
											Total of Receptor Risks Across All Media	2.E-04		Total of Receptor Hazards Across All Media		1.E+00

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).
(1) Receptor assessed using the Johnson and Ettinger Model (see Table 4.7)
(2) Receptor assessed using shower model from Foster and Chrostowski (1989) (See Table 4.8)

TABLE E.2-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	35775	mg/kg	3.92E-02	mg/kg-day	--	--	--	4.57E-01	mg/kg-day	1.00E+00	mg/kg-day	5.E-01
				Antimony	1.764	mg/kg	1.93E-06	mg/kg-day	--	--	--	2.26E-05	mg/kg-day	4.00E-04	mg/kg-day	6.E-02
				Arsenic	8.766	mg/kg	9.61E-06	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	1.E-05	1.12E-04	mg/kg-day	3.00E-04	mg/kg-day	4.E-01
				Chromium	61.1	mg/kg	6.70E-05	mg/kg-day	--	--	--	7.81E-04	mg/kg-day	3.00E-03	mg/kg-day	3.E-01
				Cobalt	10.81	mg/kg	1.18E-05	mg/kg-day	--	--	--	1.38E-04	mg/kg-day	2.00E-02	mg/kg-day	7.E-03
				Iron	39769	mg/kg	4.36E-02	mg/kg-day	--	--	--	5.08E-01	mg/kg-day	7.00E-01	mg/kg-day	7.E-01
				Lead	86.53	mg/kg	9.48E-05	mg/kg-day	--	--	--	1.11E-03	mg/kg-day	--	--	--
				Manganese	355.6	mg/kg	3.90E-04	mg/kg-day	--	--	--	4.55E-03	mg/kg-day	2.00E-02	mg/kg-day	2.E-01
				Thallium	0.354	mg/kg	3.88E-07	mg/kg-day	--	--	--	4.53E-06	mg/kg-day	7.00E-05	mg/kg-day	6.E-02
				Vanadium	74.59	mg/kg	8.17E-05	mg/kg-day	--	--	--	9.54E-04	mg/kg-day	1.00E-03	mg/kg-day	1.E+00
				Aroclor 1248	0.45	mg/kg	4.93E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-06	5.75E-06	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	1.32E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-07	1.53E-06	mg/kg-day	2.00E-05	mg/kg-day	8.E-02
				4-Methyl-2-Pentanone	0.01111	mg/kg	1.22E-08	mg/kg-day	--	--	--	1.42E-07	mg/kg-day	--	--	--
				Cyclohexane	0.004	mg/kg	4.38E-09	mg/kg-day	--	--	--	5.11E-08	mg/kg-day	--	--	--
				Methylcyclohexane	0.0265	mg/kg	2.90E-08	mg/kg-day	--	--	--	3.39E-07	mg/kg-day	--	--	--
				Di-n-octylphalate	0.14	mg/kg	1.53E-07	mg/kg-day	--	--	--	1.79E-06	mg/kg-day	4.00E-02	mg/kg-day	4.E-05
				Benzo(a)pyrene*	0.0595	mg/kg	6.52E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	3.E-06	7.61E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.21	mg/kg	2.30E-07	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	9.E-06	2.68E-06	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	6.79E-12	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.E-06	7.93E-11	mg/kg-day	--	--	--
			Exp. Route Total								3.E-05					3.E+00
			Dermal Absorption	Aluminum	35775	mg/kg	1.10E-03	mg/kg-day	--	--	--	1.28E-02	mg/kg-day	1.00E+00	mg/kg-day	1.E-02
				Antimony	1.764	mg/kg	5.41E-08	mg/kg-day	--	--	--	6.31E-07	mg/kg-day	6.00E-05	mg/kg-day	1.E-02
				Arsenic	8.766	mg/kg	8.07E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	1.E-06	9.41E-06	mg/kg-day	3.00E-04	mg/kg-day	3.E-02
				Chromium	61.1	mg/kg	1.87E-06	mg/kg-day	--	--	--	2.19E-05	mg/kg-day	7.50E-05	mg/kg-day	3.E-01
				Cobalt	10.81	mg/kg	3.32E-07	mg/kg-day	--	--	--	3.87E-06	mg/kg-day	2.00E-02	mg/kg-day	2.E-04
				Iron	39769	mg/kg	1.22E-03	mg/kg-day	--	--	--	1.42E-02	mg/kg-day	7.00E-01	mg/kg-day	2.E-02
				Manganese	355.6	mg/kg	1.09E-05	mg/kg-day	--	--	--	1.27E-04	mg/kg-day	8.00E-04	mg/kg-day	2.E-01
				Thallium	0.354	mg/kg	1.09E-08	mg/kg-day	--	--	--	1.27E-07	mg/kg-day	7.00E-05	mg/kg-day	2.E-03
				Vanadium	74.59	mg/kg	2.29E-06	mg/kg-day	--	--	--	2.67E-05	mg/kg-day	2.60E-05	mg/kg-day	1.E+00
				Aroclor 1248	0.45	mg/kg	1.93E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-07	2.26E-06	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	5.16E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-07	6.01E-07	mg/kg-day	2.00E-05	mg/kg-day	3.E-02
				4-Methyl-2-Pentanone	0.01111	mg/kg	1.02E-09	mg/kg-day	--	--	--	1.19E-08	mg/kg-day	--	--	--
				Cyclohexane	0.004	mg/kg	6.14E-12	mg/kg-day	--	--	--	7.16E-11	mg/kg-day	--	--	--
				Methylcyclohexane	0.0265	mg/kg	2.44E-09	mg/kg-day	--	--	--	2.85E-08	mg/kg-day	--	--	--
				Di-n-octylphalate	0.14	mg/kg	4.30E-08	mg/kg-day	--	--	--	5.01E-07	mg/kg-day	4.00E-02	mg/kg-day	1.E-05
				Benzo(a)pyrene*	0.0595	mg/kg	2.37E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	9.E-07	2.77E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.21	mg/kg	8.38E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	3.E-06	9.77E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	5.71E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	9.E-08	6.66E-12	mg/kg-day	--	--	--
			Exp. Route Total								6.E-06					2.E+00
		Exposure Point Total									3.E-05					5.E+00
	Exposure Medium Total										3.E-05					5.E+00

TABLE E.2-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	35775	mg/kg	4.50E-07	mg/kg-day	--	--	--	5.25E-06	mg/kg-day	1.00E-03	mg/kg-day	5.E-03
				Antimony	1.764	mg/kg	2.22E-11	mg/kg-day	--	--	--	2.59E-10	mg/kg-day	--	--	--
				Arsenic	8.766	mg/kg	1.10E-10	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	2.E-09	1.29E-09	mg/kg-day	--	--	--
				Chromium	61.1	mg/kg	7.69E-10	mg/kg-day	4.10E+01	mg/kg-day $^{-1}$	3.E-08	8.97E-09	mg/kg-day	2.90E-05	mg/kg-day	3.E-04
				Cobalt	10.81	mg/kg	1.36E-10	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	1.E-09	1.59E-09	mg/kg-day	5.70E-06	mg/kg-day	3.E-04
				Iron	39769	mg/kg	5.00E-07	mg/kg-day	--	--	--	5.84E-06	mg/kg-day	--	--	--
				Manganese	355.6	mg/kg	4.47E-09	mg/kg-day	--	--	--	5.22E-08	mg/kg-day	1.43E-05	mg/kg-day	4.E-03
				Thallium	0.354	mg/kg	4.45E-12	mg/kg-day	--	--	--	5.20E-11	mg/kg-day	--	--	--
				Vanadium	74.59	mg/kg	9.39E-10	mg/kg-day	--	--	--	1.10E-08	mg/kg-day	--	--	--
				Aroclor 1248	0.45	mg/kg	5.66E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-11	6.61E-11	mg/kg-day	--	--	--
				Aroclor 1254	0.12	mg/kg	1.51E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-12	1.76E-11	mg/kg-day	--	--	--
				4-Methyl-2-Pentanone	0.01111	mg/kg	1.40E-13	mg/kg-day	--	--	--	1.63E-12	mg/kg-day	8.60E-01	mg/kg-day	2.E-12
				Cyclohexane	0.004	mg/kg	5.03E-14	mg/kg-day	--	--	--	5.87E-13	mg/kg-day	1.70E+00	mg/kg-day	3.E-13
				Methylcyclohexane	0.0265	mg/kg	3.33E-13	mg/kg-day	--	--	--	3.89E-12	mg/kg-day	8.60E-01	mg/kg-day	5.E-12
				Di-n-octylphalate	0.14	mg/kg	1.76E-12	mg/kg-day	--	--	--	2.06E-11	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0595	mg/kg	7.49E-13	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	1.E-11	8.73E-12	mg/kg-day	--	--	--
				Dibenz(a,h)anthrancene*	0.21	mg/kg	2.64E-12	mg/kg-day	--	--	--	3.08E-11	mg/kg-day	--	--	--
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	7.80E-17	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.E-11	9.10E-16	mg/kg-day	--	--	--
			Exp. Route Total								3.E-08					9.E-03
		Exposure Point Total									3.E-08					9.E-03
		Outdoor Vapors	Inhalation	4-Methyl-2-Pentanone	0.01111	mg/kg	2.54E-08	mg/kg-day	--	--	--	2.96E-07	mg/kg-day	8.60E-01	mg/kg-day	3.E-07
				Cyclohexane	0.004	mg/kg	5.75E-08	mg/kg-day	--	--	--	6.71E-07	mg/kg-day	1.70E+00	mg/kg-day	4.E-07
				Methylcyclohexane	0.0265	mg/kg	4.21E-07	mg/kg-day	--	--	--	4.91E-06	mg/kg-day	8.60E-01	mg/kg-day	6.E-06
			Exp. Route Total								--					6.E-06
		Exposure Point Total									--					6.E-06
		Upward Migration of Vapors from Soil Indoor Air	Inhalation	4-Methyl-2-Pentanone	9.98E-04	mg/m^3	4.92E-05	mg/kg-day	--	--	--	5.74E-04	mg/kg-day	8.60E-01	mg/kg-day	7.E-04
				Cyclohexane	3.61E-02	mg/m^3	1.78E-03	mg/kg-day	--	--	--	2.08E-02	mg/kg-day	1.70E+00	mg/kg-day	1.E-02
				Methylcyclohexane	4.05E-01	mg/m^3	2.00E-02	mg/kg-day	--	--	--	2.33E-01	mg/kg-day	8.60E-01	mg/kg-day	3.E-01
			Exp. Route Total								--					3.E-01
		Exposure Point Total									--					3.E-01
	Exposure Medium Total										3.E-08					3.E-01
Soil Total											3.E-05					5.E+00
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Chloroform	24	ug/L	1.32E-04	mg/kg-day	--	--	--	1.53E-03	mg/kg-day	1.00E-02	mg/kg-day	2.E-01
			Exp. Route Total								--					2.E-01
			Dermal Absorption	Chloroform	24	ug/L	1.16E-05	mg/kg-day	--	--	--	1.35E-04	mg/kg-day	1.00E-02	mg/kg-day	1.E-02
			Exp. Route Total								--					1.E-02
		Exposure Point Total									--					2.E-01
	Exposure Medium Total										--					2.E-01

TABLE E.2-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
	Air	Upward Migration of Vapors from Groundwater (Indoor) (1)	Inhalation	Chloroform	1.25E-04	mg/m^3	6.16E-06	mg/kg-day	8.10E-02	$mg/kg\text{-}day^{-1}$	5.E-07	7.19E-05	mg/kg-day	1.40E-02	mg/kg-day	5.E-03
			Exp. Route Total								5.E-07					5.E-03
		Exposure Point Total									5.E-07					5.E-03
	Exposure Medium Total										5.E-07					5.E-03
Groundwater Total											5.E-07					2.E-01
											Total of Receptor Risks Across All Media					3.E-05
												Total of Receptor Hazards Across All Media				5.E+00

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).
(1) Receptor assessed using the Johnson and Ettinger Model (see Table 4.7)

TABLE E.2-7.7.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Total Soil	Soil	Soil	Ingestion	Aluminum	35775	mg/kg	--
				Antimony	1.764	mg/kg	--
				Arsenic	8.766	mg/kg	2.E-05
				Chromium	61.1	mg/kg	--
				Cobalt	10.81	mg/kg	--
				Iron	39769	mg/kg	--
				Lead	86.53	mg/kg	--
				Manganese	355.6	mg/kg	--
				Thallium	0.354	mg/kg	--
				Vanadium	74.59	mg/kg	--
				Aroclor 1248	0.45	mg/kg	1.E-06
				Aroclor 1254	0.12	mg/kg	4.E-07
				4-Methyl-2-Pentanone	0.01111	mg/kg	--
				Cyclohexane	0.004	mg/kg	--
				Methylcyclohexane	0.0265	mg/kg	--
				Di-n-octylphalate	0.14	mg/kg	--
				Benzo(a)pyrene*	0.0595	mg/kg	3.E-06
				Dibenz(a,h)anthrancene*	0.21	mg/kg	1.E-05
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	1.E-06
			Exp. Route Total				4.E-05
			Dermal Absorption	Aluminum	35775	mg/kg	--
				Antimony	1.764	mg/kg	--
				Arsenic	8.766	mg/kg	2.E-06
				Chromium	61.1	mg/kg	--
				Cobalt	10.81	mg/kg	--
				Iron	39769	mg/kg	--
				Lead	86.53	mg/kg	--
				Manganese	355.6	mg/kg	--
				Thallium	0.354	mg/kg	--
				Vanadium	74.59	mg/kg	--
				Aroclor 1248	0.45	mg/kg	6.E-07
				Aroclor 1254	0.12	mg/kg	2.E-07
				4-Methyl-2-Pentanone	0.01111	mg/kg	--
				Cyclohexane	0.004	mg/kg	--
				Methylcyclohexane	0.0265	mg/kg	--
				Di-n-octylphalate	0.14	mg/kg	--
				Benzo(a)pyrene*	0.0595	mg/kg	1.E-06
				Dibenz(a,h)anthrancene*	0.21	mg/kg	4.E-06
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	1.E-07
			Exp. Route Total				8.E-06
		Exposure Point Total					4.E-05
	Exposure Medium Total						4.E-05
	Air	Fugitive Dust	Inhalation	Aluminum	35775	mg/kg	--
				Antimony	1.764	mg/kg	--
				Arsenic	8.766	mg/kg	2.E-09
				Chromium	61.1	mg/kg	5.E-08
				Cobalt	10.81	mg/kg	2.E-09
				Iron	39769	mg/kg	--
				Lead	86.53	mg/kg	--
				Manganese	355.6	mg/kg	--
				Thallium	0.354	mg/kg	--
				Vanadium	74.59	mg/kg	--
				Aroclor 1248	0.45	mg/kg	2.E-11
				Aroclor 1254	0.12	mg/kg	4.E-12
				4-Methyl-2-Pentanone	0.01111	mg/kg	--
				Cyclohexane	0.004	mg/kg	--
				Methylcyclohexane	0.0265	mg/kg	--
				Di-n-octylphalate	0.14	mg/kg	--
				Benzo(a)pyrene*	0.0595	mg/kg	1.E-11
				Dibenz(a,h)anthrancene*	0.21	mg/kg	--
				2,3,7,8-TCDD TEQ	6.2E-06	mg/kg	2.E-11
			Exp. Route Total				5.E-08
		Exposure Point Total					5.E-08

TABLE E.2-7.7.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Total Soil Cont.	Air Cont	Outdoor Vapors	Inhalation	4-Methyl-2-Pentanone	0.01111	mg/kg	--
				Cyclohexane	0.004	mg/kg	--
				Methylcyclohexane	0.0265	mg/kg	--
			Exp. Route Total				--
		Exposure Point Total					--
		Upward Migration of Vapors from Soil Indoor Air	Inhalation	4-Methyl-2-Pentanone	0.000998	mg/m^3	--
				Cyclohexane	0.0361	mg/m^4	--
				Methylcyclohexane	0.405	mg/m^5	--
			Exp. Route Total				--
		Exposure Point Total					--
	Exposure Medium Total						5.E-08
Soil Total							5.E-05
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Chloroform	24	ug/L	--
			Exp. Route Total				--
			Dermal Absorption	Chloroform	24	ug/L	--
			Exp. Route Total				--
		Exposure Point Total					--
	Exposure Medium Total						--
	Air	Upward Migration of Vapors from Groundwater (Indoor) (1)	Inhalation	Chloroform	0.000125	mg/m^3	1.E-06
			Exp. Route Total				1.E-06
		Exposure Point Total					1.E-06
		Vapors While Showering with Groundwater (2)	Inhalation	Chloroform	1.91	mg/m^3	2.E-04
			Exp. Route Total				2.E-04
		Exposure Point Total					2.E-04
	Exposure Medium Total						2.E-04
Groundwater Total							2.E-04
							2.E-04

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).

(1) Receptor assessed using the Johnson and Ettinger Model (see Table 4.7)

(2) Receptor assessed using shower model from Foster and Chrostowski (1989) (See Table 4.8)

TABLE E.2-9.1.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Maintenance Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	4.2.E-03	--	1.E-04	4.E-03
			Antimony	--	--	--	--	Antimony	blood	6.E-03	--	1.E-03	7.E-03
			Arsenic	1.5.E-06	--	1.E-07	2.E-06	Arsenic	skin/ vascular	9.E-03	--	9.E-04	1.E-02
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	2.E-03	--	3.E-03	5.E-03
			Cobalt	--	--	--	--	Cobalt	blood	9.E-05	--	3.E-06	9.E-05
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	7.E-03	--	2.E-04	7.E-03
			Manganese	--	--	--	--	Manganese	CNS	5.E-03	--	4.E-03	8.E-03
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	1.E-03	--	4.E-05	1.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	1.E-02	--	1.E-02	2.E-02
			Aroclor 1248	6.3.E-08	--	3.E-08	9.E-08	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	5.4.E-08	--	2.E-08	8.E-08	Aroclor 1254	eyes	4.E-03	--	2.E-03	6.E-03
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
				2.E-06	--	2.E-07	2.E-06			4.9.E-02	--	2.4.E-02	7.E-02
		Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	4.E-04	--	4.E-04
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	1.E-09	--	1.E-09	Arsenic	NA	--	--	--	--
			Chromium	--	8.E-09	--	8.E-09	Chromium	respiratory	--	2.E-05	--	2.E-05
			Cobalt	--	6.E-10	--	6.E-10	Cobalt	respiratory	--	3.E-05	--	3.E-05
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	6.E-04	--	6.E-04
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Aroclor 1248	--	6.E-12	--	6.E-12	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	--	5.E-12	--	5.E-12	Aroclor 1254	NA	--	--	--	--
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	3.E-13	--	3.E-13
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	4.E-14	--	4.E-14
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	6.E-13	--	6.E-13
				--	1.E-08	--	1.E-08			--	1.E-03	--	1.E-03
		Air (Outdoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	3.E-08	--	3.E-08
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	2.E-08	--	2.E-08
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	3.E-07	--	3.E-07
				--	--	--	--			--	4.E-07	--	4.E-07
							Total Risk Across Soil	2.E-06					Total Hazard Index Across Soil	7.E-02

Total Risk Across All Media and All Exposure Routes	2.E-06
Total Hazard Index Across All Media and All Exposure Routes	7.E-02

Total blood HI across all media =	2.E-02
Total CNS HI across all media =	1.E-02
Total skin HI across all media =	1.E-02
Total respiratory HI across all media =	5.E-05
Total GI tract HI across all media =	1.E-02
Total kidney HI across all media =	2.E-02
Total liver HI across all media =	1.E-02
Total vascular HI across all media =	1.E-02
Total eyes HI across all media =	6.E-03

TABLE E.2-9.2.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Maintenance Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	7.0.E-03	--	2.E-04	7.E-03
			Antimony	--	--	--	--	Antimony	blood	8.6.E-04	--	2.E-04	1.E-03
			Arsenic	9.E-07	--	9.E-08	1.E-06	Arsenic	skin/ vascular	5.7.E-03	--	6.E-04	6.E-03
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	4.0.E-03	--	5.E-03	9.E-03
			Cobalt	--	--	--	--	Cobalt	blood	1.1.E-04	--	3.E-06	1.E-04
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	1.1.E-02	--	4.E-04	1.E-02
			Lead	--	--	--	--	Lead	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	3.5.E-03	--	3.E-03	6.E-03
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	9.9.E-04	--	3.E-05	1.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	1.5.E-02	--	2.E-02	3.E-02
			Aroclor 1248	6.E-08	--	3.E-08	9.E-08	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	2.E-08	--	8.E-09	2.E-08	Aroclor 1254	eyes	1.2.E-03	--	5.E-04	2.E-03
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphalate	--	--	--	--	Di-n-octylphalate	liver/thyroid	6.8.E-07	--	2.E-07	9.E-07
			Benzo(a)pyrene	3.E-08	--	1.E-08	4.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	1.E-07	--	5.E-08	2.E-07	Dibenz(a,h)anthrancene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	6.E-08	--	6.E-09	7.E-08	2,3,7,8-TCDD TEQ	NA	--	--	--	--
				1.E-06	--	2.E-07	1.E-06			4.9.E-02	--	2.9.E-02	8.E-02
		Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	6.E-04	--	6.E-04
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	8.E-10	--	8.E-10	Arsenic	NA	--	--	--	--
			Chromium	--	2.E-08	--	2.E-08	Chromium	respiratory	--	4.E-05	--	4.E-05
			Cobalt	--	7.E-10	--	7.E-10	Cobalt	respiratory	--	3.E-05	--	3.E-05
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Lead	--	--	--	--	Lead	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	4.E-04	--	4.E-04
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Aroclor 1248	--	6.E-12	--	6.E-12	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	--	2.E-12	--	2.E-12	Aroclor 1254	NA	--	--	--	--
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	2.E-13	--	2.E-13
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	4.E-14	--	4.E-14
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	6.E-13	--	6.E-13
			Di-n-octylphalate	--	--	--	--	Di-n-octylphalate	NA	--	--	--	--
			Benzo(a)pyrene	--	1.E-12	--	1.E-12	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	--	--	--	--	Dibenz(a,h)anthrancene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	6.E-12	--	6.E-12	2,3,7,8-TCDD TEQ	NA	--	--	--	--
				--	2.E-08	--	2.E-08			--	1.E-03	--	1.E-03
		Air (Outdoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	2.E-08	--	2.E-08
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	2.E-08	--	2.E-08
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	3.E-07	--	3.E-07
				--	--	--	--			--	4.E-07	--	4.E-07
						Total Risk Across Soil	1.E-06					Total Hazard Index Across Soil	8.E-02

Total Risk Across All Media and All Exposure Routes	1.E-06
Total Hazard Index Across All Media and All Exposure Routes	8.E-02

Total blood HI across all media =	1.E-02
Total CNS HI across all media =	1.E-02
Total skin HI across all media =	6.E-03
Total respiratory HI across all media =	7.E-05
Total GI tract HI across all media =	2.E-02
Total kidney HI across all media =	3.E-02
Total liver HI across all media =	2.E-02
Total vascular HI across all media =	6.E-03
Total eyes HI across all media =	2.E-03

TABLE E.2-9.3.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Commercial Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	2.E-02	--	1.E-03	2.E-02
			Antimony	--	--	--	--	Antimony	blood	2.E-03	--	9.E-04	3.E-03
			Arsenic	2.E-06	--	5.E-07	3.E-06	Arsenic	skin/ vascular	1.E-02	--	3.E-03	2.E-02
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	1.E-02	--	3.E-02	4.E-02
			Cobalt	--	--	--	--	Cobalt	blood	3.E-04	--	2.E-05	3.E-04
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	2.8.E-02	--	2.E-03	3.E-02
			Manganese	--	--	--	--	Manganese	CNS	8.7.E-03	--	1.4.E-02	2.E-02
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	2.E-03	--	2.E-04	3.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	4.E-02	--	9.E-02	1.E-01
			Aroclor 1248	2.E-07	--	1.E-07	3.E-07	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	4.E-08	--	4.E-08	8.E-08	Aroclor 1254	eyes	3.E-03	--	3.E-03	6.E-03
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphalate	--	--	--	--	Di-n-octylphalate	liver/thyroid	2.E-06	--	1.E-06	3.E-06
			Benzo(a)pyrene	8.E-08	--	7.E-08	1.E-07	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	3.E-07	--	2.E-07	5.E-07	Dibenz(a,h)anthrancene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	2.E-07	--	3.E-08	2.E-07	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	3.E-06	--	1.E-06	4.E-06	Total		1.E-01	--	1.E-01	3.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	2.E-03	--	2.E-03
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	3.E-09	--	3.E-09	Arsenic	NA	--	--	--	--
			Chromium	--	5.4.E-08	--	5.4.E-08	Chromium	respiratory	--	1.E-04	--	1.E-04
			Cobalt	--	2.3.E-09	--	2.3.E-09	Cobalt	respiratory	--	1.E-04	--	1.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	1.E-03	--	1.E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Aroclor 1248	--	2.E-11	--	2.E-11	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	--	5.E-12	--	5.E-12	Aroclor 1254	NA	--	--	--	--
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	8.E-13	--	8.E-13
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	1.E-13	--	1.E-13
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	2.E-12	--	2.E-12
			Di-n-octylphalate	--	--	--	--	Di-n-octylphalate	NA	--	--	--	--
			Benzo(a)pyrene	--	4.E-12	--	4.E-12	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	--	--	--	--	Dibenz(a,h)anthrancene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	2.E-11	--	2.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	6.E-08	--	6.E-08	Total		--	4.E-03	--	4.E-03
		Air (Outdoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	7.E-08	--	7.E-08
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	8.E-08	--	8.E-08
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	1.E-06	--	1.E-06
				--	--	--	--			--	1.E-06	--	1.E-06
		Air (Indoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	9.E-05	--	9.E-05
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	2.E-03	--	2.E-03
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	4.E-02	--	4.E-02
				--	--	--	--			--	4.E-02	--	4.E-02

TABLE E.2-9.3.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Commercial Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater used as tapwater	Chloroform	--	--	--	--	Chloroform	liver	2.E-02	--	3.E-04	2.E-02
			Total	--	--	--	--	Total		2.E-02	--	3.E-04	2.E-02
	Air	Air (Indoor Air)	Chloroform	--	3.E-07	--	3.E-07	Chloroform	liver	--	7.E-04	--	7.E-04
				--	3.E-07	--	3.E-07			--	7.E-04	--	7.E-04
						Total Risk Across Soil	4.E-06					Total Hazard Index Across Soil	3.E-01
						Total Risk Across Groundwater	3.E-07					Total Hazard Index Across Groundwater	2.E-02
						Total Risk Across All Media and All Exposure Routes	4.E-06					Total Hazard Index Across All Media and All Exposure Routes	3.E-01

Total blood HI across all media =	4.E-02
Total CNS HI across all media =	5.E-02
Total skin HI across all media =	2.E-02
Total respiratory HI across all media =	2.E-04
Total GI tract HI across all media =	7.E-02
Total kidney HI across all media =	2.E-01
Total liver HI across all media =	9.E-02
Total vascular HI across all media =	2.E-02
Total eyes HI across all media =	6.E-03
Total hair HI across all media =	3.E-03
Total thyroid HI across all media =	3.E-06
Total fetus HI across all media =	4.E-02

TABLE E.2-9.4.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Construction Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	1.E-01	--	3.E-03	1.E-01
			Antimony	--	--	--	--	Antimony	blood	3.E-02	--	6.E-03	3.E-02
			Arsenic	6.E-07	--	5.E-08	7.E-07	Arsenic	skin/ vascular	9.E-02	--	8.E-03	1.E-01
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	1.E-02	--	1.E-02	2.E-02
			Cobalt	--	--	--	--	Cobalt	blood	2.E-03	--	5.E-05	2.E-03
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	4.E-01	--	1.E-02	4.E-01
			Manganese	--	--	--	--	Manganese	CNS	6.E-02	--	4.E-02	1.E-01
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	2.E-02	--	5.E-04	2.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	3.E-02	--	4.E-02	7.E-02
			Aroclor 1248	4.E-08	--	2.E-08	6.E-08	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	1.E-08	--	5.E-09	2.E-08	Aroclor 1254	eyes	8.E-03	--	3.E-03	1.E-02
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphalate	--	--	--	--	Di-n-octylphalate	liver/thyroid	1.E-06	--	3.E-07	1.E-06
			Benzo(a)pyrene	2.E-08	--	8.E-09	3.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	7.E-08	--	3.E-08	1.E-07	Dibenz(a,h)anthrancene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	4.E-08	--	4.E-09	5.E-08	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	8.E-07	--	1.E-07	9.E-07	Total		8.E-01	--	1.E-01	9.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	2.1.E+00	--	2.E+00
			Antimony	--	--	--	--	Antimony	NA	--	1.E-03	--	1.E-03
			Arsenic	--	2.E-07	--	2.E-07	Arsenic	NA	--	--	--	--
			Chromium	--	3.E-06	--	3.E-06	Chromium	respiratory	--	2.E-01	--	2.E-01
			Cobalt	--	1.E-07	--	1.E-07	Cobalt	respiratory	--	2.E-01	--	2.E-01
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	2.E+00	--	2.E+00
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Aroclor 1248	--	1.E-09	--	1.E-09	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	--	3.E-10	--	3.E-10	Aroclor 1254	NA	--	--	--	--
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	1.E-09	--	1.E-09
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	2.E-10	--	2.E-10
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	3.E-09	--	3.E-09
			Di-n-octylphalate	--	--	--	--	Di-n-octylphalate	NA	--	--	--	--
			Benzo(a)pyrene	--	2.E-10	--	2.E-10	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthrancene	--	--	--	--	Dibenz(a,h)anthrancene	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	1.E-09	--	1.E-09	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	3.E-06	--	3.E-06	Total		--	5.E+00	--	5.E+00

TABLE E.2-9.4.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Construction Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
		Air (Outdoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	6.E-07	--	6.E-07
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	7.E-07	--	7.E-07
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	1.E-05	--	1.E-05
				--	--	--	--			--	1.E-05	--	1.E-05
Groundwater	Air	Air (Trench Air)	Chloroform	--	4.E-09	--	4.E-09	Chloroform	liver	--	2.E-04	--	2.E-04
				--	4.E-09	--	4.E-09			--	2.E-04	--	2.E-04
						Total Risk Across Soil	4.E-06					Total Hazard Index Across Soil	5.E+00
						Total Risk Across Groundwater	4.E-09					Total Hazard Index Across Groundwater	2.E-04

Total Risk Across All Media and All Exposure Routes	4.E-06	Total Hazard Index Across All Media and All Exposure Routes	5.E+00

Total blood HI across all media =	5.E-01
Total CNS HI across all media =	4.E+00
Total skin HI across all media =	1.E-01
Total respiratory HI across all media =	3.E-01
Total GI tract HI across all media =	5.E-01
Total kidney HI across all media =	7.E-02
Total liver HI across all media =	5.E-01
Total vascular HI across all media =	1.E-01
Total eyes HI across all media =	1.E-02
Total hair HI across all media =	2.E-02
Total thyroid HI across all media =	1.E-06
Total fetus HI across all media =	2.E-02

TABLE E.2-9.5.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adult Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	5.E-02	--	2.E-03	5.E-02
			Antimony	--	--	--	--	Antimony	blood	6.E-03	--	2.E-03	8.E-03
			Arsenic	6.E-06	--	7.E-07	7.E-06	Arsenic	skin/ vascular	4.E-02	--	5.E-03	4.E-02
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	3.E-02	--	4.E-02	7.E-02
			Cobalt	--	--	--	--	Cobalt	blood	7.E-04	--	3.E-05	8.E-04
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	8.E-02	--	3.E-03	8.E-02
			Manganese	--	--	--	--	Manganese	CNS	2.E-02	--	--	2.E-02
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	7.E-03	--	2.E-02	3.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	1.E-01	--	3.E-04	1.E-01
			Aroclor 1248	4.E-07	--	--	4.E-07	Aroclor 1248	NA	--	--	2.E-01	2.E-01
			Aroclor 1254	1.E-07	--	2.E-07	3.E-07	Aroclor 1254	eyes	8.E-03	--	--	8.E-03
			4-Methyl-2-Pentanone	--	--	6.E-08	6.E-08	4-Methyl-2-Pentanone	NA	--	--	5.E-03	5.E-03
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphalate	--	--	--	--	Di-n-octylphalate	liver/thyroid	5.E-06	--	--	5.E-06
			Benzo(a)pyrene*	4.E-07	--	--	4.E-07	Benzo(a)pyrene*	NA	--	--	2.E-06	2.E-06
			Dibenz(a,h)anthrancene*	1.E-06	--	2.E-07	2.E-06	Dibenz(a,h)anthrancene*	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	4.E-07	--	7.E-07	1.E-06	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	9.E-06	--	2.E-06	1.E-05	Total		3.E-01	--	2.E-01	6.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	6.E-04	--	6.E-04
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	8.E-10	--	8.E-10	Arsenic	NA	--	--	--	--
			Chromium	--	1.E-08	--	1.E-08	Chromium	respiratory	--	4.E-05	--	4.E-05
			Cobalt	--	6.E-10	--	6.E-10	Cobalt	respiratory	--	3.E-05	--	3.E-05
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	4.E-04	--	4.E-04
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Aroclor 1248	--	5.E-12	--	5.E-12	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	--	1.E-12	--	1.E-12	Aroclor 1254	NA	--	--	--	--
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	2.E-13	--	2.E-13
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	4.E-14	--	4.E-14
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	5.E-13	--	5.E-13
			Di-n-octylphalate	--	--	--	--	Di-n-octylphalate	NA	--	--	--	--
			Benzo(a)pyrene*	--	2.E-12	--	2.E-12	Benzo(a)pyrene*	NA	--	--	--	--
			Dibenz(a,h)anthrancene*	--	--	--	--	Dibenz(a,h)anthrancene*	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	6.E-12	--	6.E-12	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	2.E-08	--	2.E-08	Total		--	1.E-03	--	1.E-03
		Air (Outdoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	2.E-08	--	2.E-08
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	2.E-08	--	2.E-08
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	3.E-07	--	3.E-07
				--	--	--	--			--	4.E-07	--	4.E-07
		Air (Indoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	2.E-04	--	2.E-04
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	4.E-03	--	4.E-03
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	9.E-02	--	9.E-02
				--	--	--	--			--	9.E-02	--	9.E-02

TABLE E.2-9.5.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adult Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater used as tapwater	Chloroform	--	--	--	--	Chloroform	liver	7.E-02	--	6.E-03	7.E-02
			Total	--	--	--	--	Total		6.6.E-02	--	6.E-03	7.E-02
	Air	Air (Indoor Air)	Chloroform	--	6.E-07	--	6.E-07	Chloroform	liver	--	2.E-03	--	2.E-03
				--	6.E-07	--	6.E-07			--	2.E-03	--	2.E-03
		Air (Shower Air)	Chloroform	--	2.E-04	--	2.E-04	Chloroform	liver	--	3.E-01	--	3.E-01
				--	2.E-04	--	2.E-04			--	3.E-01	--	3.E-01
						Total Risk Across Soil	1.1.E-05					Total Hazard Index Across Soil	7.E-01
						Total Risk Across Groundwater	1.6.E-04					Total Hazard Index Across Groundwater	4.E-01
						Total Risk Across All Media and All Exposure Routes	2.E-04					Total Hazard Index Across All Media and All Exposure Routes	1.E+00

Total blood HI across all media =	1.E-01
Total CNS HI across all media =	8.E-02
Total skin HI across all media =	4.E-02
Total respiratory HI across all media =	7.E-05
Total GI tract HI across all media =	2.E-01
Total kidney HI across all media =	2.E-01
Total liver HI across all media =	6.E-01
Total vascular HI across all media =	4.E-02
Total eyes HI across all media =	8.E-03
Total hair HI across all media =	3.E-02
Total thyroid HI across all media =	5.E-06
Total fetus HI across all media =	8.E-02

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).

TABLE E.2-9.6.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Child Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	5.E-01	--	1.E-02	5.E-01
			Antimony	--	--	--	--	Antimony	blood	6.E-02	--	1.E-02	7.E-02
			Arsenic	1.E-05	--	1.E-06	2.E-05	Arsenic	skin/ vascular	4.E-01	--	3.E-02	4.E-01
			Chromium	--	--	--	--	Chromium	GI tract/fetus/bone marrow/liver	3.E-01	--	3.E-01	6.E-01
			Cobalt	--	--	--	--	Cobalt	blood	7.E-03	--	2.E-04	7.E-03
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	7.E-01	--	2.E-02	7.E-01
			Manganese	--	--	--	--	Manganese	CNS	2.E-01	--	2.E-01	4.E-01
			Thallium	--	--	--	--	Thallium	liver/ blood/ hair	6.E-02	--	2.E-03	7.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	1.E+00	--	1.E+00	2.E+00
			Aroclor 1248	1.E-06	--	4.E-07	1.E-06	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	3.E-07	--	1.E-07	4.E-07	Aroclor 1254	eyes	8.E-02	--	3.E-02	1.E-01
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	NA	--	--	--	--
			Cyclohexane	--	--	--	--	Cyclohexane	NA	--	--	--	--
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	NA	--	--	--	--
			Di-n-octylphalate	--	--	--	--	Di-n-octylphalate	liver/thyroid	4.E-05	--	1.E-05	6.E-05
			Benzo(a)pyrene*	3.E-06	--	9.E-07	3.E-06	Benzo(a)pyrene*	NA	--	--	--	--
			Dibenz(a,h)anthrancene*	9.E-06	--	3.E-06	1.E-05	Dibenz(a,h)anthrancene*	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	1.E-06	--	9.E-08	1.E-06	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	3.E-05	--	6.E-06	3.E-05	Total		3.E+00	--	2.E+00	5.E+00
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	5.E-03	--	5.E-03
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	2.E-09	--	2.E-09	Arsenic	NA	--	--	--	--
			Chromium	--	3.E-08	--	3.E-08	Chromium	respiratory	--	3.E-04	--	3.E-04
			Cobalt	--	1.E-09	--	1.E-09	Cobalt	respiratory	--	3.E-04	--	3.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	4.E-03	--	4.E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Aroclor 1248	--	1.E-11	--	1.E-11	Aroclor 1248	NA	--	--	--	--
			Aroclor 1254	--	3.E-12	--	3.E-12	Aroclor 1254	NA	--	--	--	--
			4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	2.E-12	--	2.E-12
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	3.E-13	--	3.E-13
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	5.E-12	--	5.E-12
			Di-n-octylphalate	--	--	--	--	Di-n-octylphalate	NA	--	--	--	--
			Benzo(a)pyrene*	--	1.E-11	--	1.E-11	Benzo(a)pyrene*	NA	--	--	--	--
			Dibenz(a,h)anthrancene*	--	--	--	--	Dibenz(a,h)anthrancene*	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	1.E-11	--	1.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	3.E-08	--	3.E-08	Total		--	9.E-03	--	9.E-03
		Air (Outdoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	3.E-07	--	3.E-07
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	4.E-07	--	4.E-07
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	6.E-06	--	6.E-06
				--	--	--	--			--	6.E-06	--	6.E-06
		Air (Indoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--	4-Methyl-2-Pentanone	fetus	--	7.E-04	--	7.E-04
			Cyclohexane	--	--	--	--	Cyclohexane	fetus	--	1.E-02	--	1.E-02
			Methylcyclohexane	--	--	--	--	Methylcyclohexane	kidney	--	3.E-01	--	3.E-01
				--	--	--	--			--	3.E-01	--	3.E-01

TABLE E.2-9.6.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Child Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater used as tapwater	Chloroform	--	--	--	--	Chloroform	liver	2.E-01	--	1.E-02	2.E-01
			Total	--	--	--	--	Total		2.E-01	--	1.E-02	2.E-01
	Air	Air (Indoor Air)	Chloroform	--	5.E-07	--	5.E-07	Chloroform	liver	--	5.E-03	--	5.E-03
				--	5.E-07	--	5.E-07			--	5.E-03	--	5.E-03
						Total Risk Across Soil	3.E-05					Total Hazard Index Across Soil	5.E+00
						Total Risk Across Groundwater	5.E-07					Total Hazard Index Across Groundwater	2.E-01
						Total Risk Across All Media and All Exposure Routes	3.E-05					Total Hazard Index Across All Media and All Exposure Routes	5.E+00

Total blood HI across all media =	9.E-01
Total CNS HI across all media =	9.E-01
Total skin HI across all media =	4.E-01
Total respiratory HI across all media =	6.E-04
Total GI tract HI across all media =	1.E+00
Total kidney HI across all media =	2.E+00
Total liver HI across all media =	2.E+00
Total vascular HI across all media =	4.E-01
Total eyes HI across all media =	1.E-01
Total hair HI across all media =	7.E-02
Total thyroid HI across all media =	6.E-05
Total fetus HI across all media =	6.E-01

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).

TABLE E.2-9.7.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Lifetime Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--
			Antimony	--	--	--	--
			Arsenic	2.E-05	--	2.E-06	2.E-05
			Chromium	--	--	--	--
			Cobalt	--	--	--	--
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Thallium	--	--	--	--
			Vanadium	--	--	--	--
			Aroclor 1248	1.E-06	--	6.E-07	2.E-06
			Aroclor 1254	4.E-07	--	2.E-07	5.E-07
			4-Methyl-2-Pentanone	--	--	--	--
			Cyclohexane	--	--	--	--
			Methylcyclohexane	--	--	--	--
			Di-n-octylphalate	--	--	--	--
			Benzo(a)pyrene*	3.E-06	--	1.E-06	4.E-06
			Dibenz(a,h)anthrancene*	1.E-05	--	4.E-06	1.E-05
			2,3,7,8-TCDD TEQ	1.E-06	--	1.E-07	2.E-06
			Total	4.E-05	--	8.E-06	4.E-05
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--
			Antimony	--	--	--	--
			Arsenic	--	2.E-09	--	2.E-09
			Chromium	--	5.E-08	--	5.E-08
			Cobalt	--	2.E-09	--	2.E-09
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Thallium	--	--	--	--
			Vanadium	--	--	--	--
			Aroclor 1248	--	2.E-11	--	2.E-11
			Aroclor 1254	--	4.E-12	--	4.E-12
			4-Methyl-2-Pentanone	--	--	--	--
			Cyclohexane	--	--	--	--
			Methylcyclohexane	--	--	--	--
			Di-n-octylphalate	--	--	--	--
			Benzo(a)pyrene*	--	1.E-11	--	1.E-11
			Dibenz(a,h)anthrancene*	--	--	--	--
			2,3,7,8-TCDD TEQ	--	2.E-11	--	2.E-11
			Total	--	5.E-08	--	5.E-08
		Air (Outdoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--
			Cyclohexane	--	--	--	--
			Methylcyclohexane	--	--	--	--
				--	--	--	--
		Air (Indoor Vapors)	4-Methyl-2-Pentanone	--	--	--	--
			Cyclohexane	--	--	--	--
			Methylcyclohexane	--	--	--	--
				--	--	--	--
Groundwater	Groundwater	Groundwater used as tapwater	Chloroform	--	--	--	--
			Total	--	--	--	--
	Air	Air (Indoor Air)	Chloroform	--	1.E-06	--	1.E-06
				--	1.E-06	--	1.E-06
		Air (Shower Air)	Chloroform	--	2.E-04	--	2.E-04
				--	2.E-04	--	2.E-04
						Total Risk Across Soil	5.E-05
						Total Risk Across Groundwater	2.E-04
						Total Risk Across All Media and All Exposure Routes	2.E-04

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.4).

TABLE E.2-10.1.RME
RME Risk Assessment Summary: Construction Worker - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	None Identified					None Identified					
			Total	--	--	--	--	Total		--	--	--	--
	Air	Air	None Identified	--	--	--	--	Aluminum	CNS	--	2.E+00	--	2.E+00
				--	--	--	--	Manganese	CNS	--	2.E+00	--	2.E+00
			Total	--	--	--	--	Total		--	4.E+00	--	4.E+00
Groundwater	Groundwater	Groundwater	None Identified					None Identified					
			Total	--	--	--	--	Total		--	--	--	--
	Air	Air (Trench Air)	None Identified	--	--	--	--	None Identified	--	--	--	--	--
				--	--	--	--			--	--	--	--
							Total Risk Across Soil	--					Total Hazard Index Across Soil	4.E+00
							Total Risk Across Groundwater	--					Total Hazard Index Across Groundwater	--
							Total Risk Across All Media and All Exposure Routes	--					Total Hazard Index Across All Media and All Exposure Routes	4.E+00
													Total CNS HI across all media =	4.E+00

TABLE E.2-10.2.RME
RME Risk Assessment Summary: Child Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Non-Carcinogenic Hazard Quotient				
				Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Chromium	GI tract/fetus/bone marrow/liver	3.E-01	--	3.E-01	5.5.E-01
			Iron	blood/ liver/ GI tract	7.E-01	--	2.E-02	7.5.E-01
			Thallium	liver/ blood/ hair	6.E-02	--	2.E-03	6.6.E-02
			Vanadium	kidney	1.E+00	--	1.E+00	2.E+00
			Total		2.E+00	--	1.E+00	3.3.E+00
	Air	Air	None Identified					
			Total		--	--	--	--
Groundwater	Groundwater	Groundwater Used as Tapwater	Chloroform	liver	2.E-01	--	1.E-02	2.E-01
			Total		--	--	--	--
							Total Hazard Index Across Soil	3.3.E+00
							Total Hazard Index Across Groundwater	2.E-01

Total Hazard Index Across All Media and All Exposure Routes	4.E+00

Total kidney HI across all media =	2.0.E+00
Total liver HI across all media =	1.5.E+00

TABLE E.2-10.3.RME
RME Risk Assessment Summary: Lifetime Resident - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	None Identified	--	--	--	--
			Total	--	--	--	--
	Air	Air	None Identified	--	--	--	--
			Total	--	--	--	--
Groundwater	Groundwater	Groundwater Used as Tapwater	Chloroform	--	2.E-04	--	2.E-04
			Total	--	2.E-04	--	2.E-04
						Total Risk Across Soil	--
						Total Risk Across Groundwater	2.E-04

Total Risk Across All Media and All Exposure Routes	2.E-04

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IRON MARGIN OF EXPOSURE EVALUATION

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Table 1
Iron "Margin of Exposure" Evaluation
SMWUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Total Soil - Child Resident - SWMU 40				
Iron EPC (mg/kg)	Child Daily Intake Estimate* (mg/day)	RDA for Child 6 mths to 4 years Old	Child Daily Intake** (mg/kg-day)	Provisional RfD (mg/kg-day)
37,114	7.1	10 mg/day	0.48	0.7
Total Soil - Child Resident - SWMU 71				
Iron EPC (mg/kg)	Child Daily Intake Estimate* (mg/day)	RDA for Child 6 mths to 4 years Old	Child Daily Intake** (mg/kg-day)	Provisional RfD (mg/kg-day)
39,769	7.6	10 mg/day	0.51	0.7

* See Table 2 for equations used to calculated daily intake estimates.
** Default weight of 15 kg used for child

Table 2
Iron "Margin of Exposure" Evaluation
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation
Ingestion-Total Soil	Resident	Child	SWMU 40/71	AT-NC	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991a	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	Chronic
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	MDC or EPC	Daily = $\frac{CS*IRS*EF*ED*FI*CF1}{BW*AT}$
				ED	Exposure Duration	6	years	USEPA, 1991a	Intake
				EF	Exposure Frequency	350	days/year	USEPA, 1991a	(mg/day)
				FI	Fraction Ingested	1	(unitless)	default	
				IRS	Ingestion Rate of Soil	200	mg/day	USEPA, 1991a	

APPENDIX E.3

DERIVATION OF RBCs FOR CARCINOGENS THAT ACT VIA A MUTAGENIC MODE OF ACTION AND INCORPORATE DEFAULT ADAFs – EXAMPLE CALCULATIONS (USEPA 2006)

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103

SUBJECT: Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFs

FROM: Jennifer Hubbard, Toxicologist
Technical Support Branch (3HS41)

TO: RBC Table Users

DATE: October 19, 2006
*corrected November 8, 2006**

Because of the special considerations for carcinogens that act via a mutagenic mode of action, this memo includes a demonstration of the assumptions behind the Region III RBCs for those chemicals that incorporate the default age-dependent adjustment factors (ADAFs). A sample calculation for each medium is provided below.

On March 29, 2005, EPA Administrator Stephen Johnson provided general direction on implementing EPA's 2005 Guidelines for Carcinogen Risk Assessment and Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens. This was followed by an announcement in the April 7, 2005 Federal Register, and by the release of additional guidance documents concerning the implementation of the new cancer guidelines.

The aspect of the new guidelines that most directly affects Region III RBCs is the use of ADAFs to adjust cancer risk for receptors whose exposure includes early life. For chemicals that EPA has determined to be carcinogenic via a mutagenic mode of action, special adjustments are applied in estimating cancer risks. Vinyl chloride has a chemical-specific adjustment, described in its IRIS file. The impact of vinyl chloride's adjustment on Region III RBCs was discussed in the May 6, 2001 memo, "Derivation of Vinyl Chloride RBCs," found at http://www.epa.gov/reg3hwmd/risk/human/info/vcrbc.pdf. For the other chemicals, where no chemical-specific ADAFs have been developed, default ADAFs are used: 10 for age 0-2, 3 for age 2-16, and no adjustment for ages 16 and up. These chemicals are now marked with an "m" on the Region III RBC Table.

One example for each medium is provided below. The exposure factors are consistent with the defaults used in the other RBCs.

**The original October 19 version of this memo contained a typographical error in Section 2A: "mg/L" was used instead of "ug/L" for the concentration term in three of the equations. The units have now been corrected.*

SAMPLE EQUATIONS - RBCs

1. Soil, Residential

Sample Chemical: Benzo[a]pyrene
PRG = 0.022 mg/kg

Age 0-2

$$\frac{0.022 \text{ mg/kg} \times 200 \text{ mg/day} \times 350 \text{ days/yr} \times 2 \text{ yrs} \times 1\text{E-}6 \text{ kg/mg}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{7.3}{\text{mg/kg/day}} \times 10 = \mathbf{5.9E\text{-}7}$$

Age 2-6

$$\frac{0.022 \text{ mg/kg} \times 200 \text{ mg/day} \times 350 \text{ days/yr} \times 4 \text{ yrs} \times 1\text{E-}6 \text{ kg/mg}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{7.3}{\text{mg/kg/day}} \times 3 = \mathbf{3.5E\text{-}7}$$

Age 6-16

$$\frac{0.022 \text{ mg/kg} \times 100 \text{ mg/day} \times 350 \text{ days/yr} \times 10 \text{ yrs} \times 1\text{E-}6 \text{ kg/mg}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{7.3}{\text{mg/kg/day}} \times 3 = \mathbf{9.4E\text{-}8}$$

Age 16-30

$$\frac{0.022 \text{ mg/kg} \times 100 \text{ mg/day} \times 350 \text{ days/yr} \times 14 \text{ yrs} \times 1\text{E-}6 \text{ kg/mg}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{7.3}{\text{mg/kg/day}} \times 1 = \mathbf{4.4E\text{-}8}$$

Total Risk
5.9E-7 + 3.5E-7 + 9.4E-8 + 4.4E-8 = 1E-6

2. Tap water

Sample chemical = Dibromochloropropane (VOC)
PRG = 2E-4 ug/L

A. Ingestion risk

Age 0-2

$$\frac{0.0002 \text{ ug/L} \times 1 \text{ L/day} \times 350 \text{ days/yr} \times 2 \text{ yrs} \times 1\text{E-}3 \text{ mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{0.8}{\text{mg/kg/day}} \times 10 = \mathbf{2.9E\text{-}9}$$

Age 2-6

$$\frac{0.0002 \text{ ug/L} \times 1 \text{ L/day} \times 350 \text{ days/yr} \times 4 \text{ yrs} \times 1\text{E-}3 \text{ mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{0.8}{\text{mg/kg/day}} \times 3 = \mathbf{1.8E\text{-}9}$$

Age 6-16

$$\frac{0.0002 \text{ ug/L} \times 2 \text{ L/day} \times 350 \text{ days/yr} \times 10 \text{ yrs} \times 1\text{E-}3 \text{ mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{0.8}{\text{mg/kg/day}} \times 3 = \mathbf{1.9E\text{-}9}$$

Age 16-30

$$\frac{0.0002 \text{ ug/L} \times 2 \text{ L/day} \times 350 \text{ days/yr} \times 14 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{0.8}{\text{mg/kg/day}} \times 1 = \mathbf{8.8E\text{-}10}$$

Total Ingestion Risk

2.9E-9 + 1.8E-9 + 1.9E-9 + 8.8E-10 = 7.5E-9

B. Inhalation risk

Age 0-2

$$\frac{2\text{E-4 ug/L} \times 0.5 \text{ L/m}^3 \times 12 \text{ m}^3\text{/dy} \times 350 \text{ dy/yr} \times 2 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{21}{\text{mg/kg/day}} \times 10 = \mathbf{4.6E\text{-}7}$$

Age 2-6

$$\frac{2\text{E-4 ug/L} \times 0.5 \text{ L/m}^3 \times 12 \text{ m}^3\text{/dy} \times 350 \text{ dy/yr} \times 4 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{21}{\text{mg/kg/day}} \times 3 = \mathbf{2.8E\text{-}7}$$

Age 6-16

$$\frac{2\text{E-4 ug/L} \times 0.5 \text{ L/m}^3 \times 20 \text{ m}^3\text{/dy} \times 350 \text{ dy/yr} \times 10 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{21}{\text{mg/kg/day}} \times 3 = \mathbf{2.5E\text{-}7}$$

Age 16-30

$$\frac{2\text{E-4 ug/L} \times 0.5 \text{ L/m}^3 \times 20 \text{ m}^3\text{/dy} \times 350 \text{ dy/yr} \times 14 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{21}{\text{mg/kg/day}} \times 1 = \mathbf{1.2E\text{-}7}$$

Total Inhalation Risk

4.6E-7 + 2.8E-7 + 2.5E-7 + 1.2E-7 = 1E-6

Total Tap Water Risk

7.5E-9 + 1E-6 = 1E-6

3. Air

Sample chemical = Benzidine

A. Dose-Based Method (Using CSF in 1/mg/kg/day)

PRG = 1E-5 ug/m^3

Age 0-2

$$\frac{1\text{E-5 ug/m}^3 \times 12 \text{ m}^3\text{/day} \times 350 \text{ days/yr} \times 2 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{230}{\text{mg/kg/day}} \times 10 = \mathbf{5E\text{-}7}$$

Age 2-6

$$\frac{1\text{E-5 ug/m}^3 \times 12 \text{ m}^3\text{/day} \times 350 \text{ days/yr} \times 4 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{230}{\text{mg/kg/day}} \times 3 = \mathbf{3E\text{-}7}$$

Age 6-16

$$\frac{1E\text{-}5\ ug/m^3 \times 20\ m^3/day \times 350\ days/yr \times 10\ yrs \times 1E\text{-}3\ mg/ug}{365\ days/yr \times 70\ yr \times 70\ kg} \times \frac{230}{mg/kg/day} \times 3 = \mathbf{2.7E\text{-}7}$$

Age 16-30

$$\frac{1E\text{-}5\ ug/m^3 \times 20\ m^3/day \times 350\ days/yr \times 14\ yrs \times 1E\text{-}3\ mg/ug}{365\ days/yr \times 70\ yr \times 70\ kg} \times \frac{230}{mg/kg/day} \times 1 = \mathbf{1.3E\text{-}7}$$

Total Risk

5E-7 + 3E-7 + 2.7E-7 + 1.3E-7 = 1E-6

B. Concentration-Based Method (Using IUR in m^3/ug).

PRG = 1.5E-5 ug/m^3

Age 0-2

$$\frac{1.5E\text{-}5\ ug/m^3 \times 350\ days/yr \times 2\ yrs}{365\ days/yr \times 70\ yr} \times \frac{0.067}{ug/m^3} \times 10 = \mathbf{2.8E\text{-}7}$$

Age 2-6

$$\frac{1.5E\text{-}5\ ug/m^3 \times 350\ days/yr \times 4\ yrs}{365\ days/yr \times 70\ yr} \times \frac{0.067}{ug/m^3} \times 3 = \mathbf{1.7E\text{-}7}$$

Age 6-16

$$\frac{1.5E\text{-}5\ ug/m^3 \times 350\ days/yr \times 10\ yrs}{365\ days/yr \times 70\ yr} \times \frac{0.067}{ug/m^3} \times 3 = \mathbf{4.1E\text{-}7}$$

Age 16-30

$$\frac{1.5E\text{-}5\ ug/m^3 \times 350\ days/yr \times 14\ yrs}{365\ days/yr \times 70\ yr} \times \frac{0.067}{ug/m^3} \times 1 = \mathbf{1.9E\text{-}7}$$

Total Risk

2.8E-7 + 1.7E-7 + 4.1E-7 + 1.9E-7 = 1E-6

Fish Tissue and Industrial Soil RBCs:
Because these RBC scenarios involve adults only, the ADAFs for early-life exposure do not apply. Therefore, these RBCs are derived in the traditional manner and are not shown in this memo.

APPENDIX E.4

JOHNSON AND ETTINGER MODEL – GROUNDWATER TO INDOOR AIR

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Table E.4-1.1a
Data Entry Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 2-Hexanone - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SL-SCREEN Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
591786	2.00E+00	2-Hexanone

MORE

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	15	10	CL		

MORE

ENTER Vandose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)
CL	1.48	0.442	0.168	0.002

ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)

5

MORE

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1

Used to calculate risk-based soil concentration.

END

Table E.4-1.1b
Chemical Properties Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 2-Hexanone - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
7.04E-02	8.44E-06	9.32E-05	25	8,243	401.00	587.00	1.48E+01	1.75E+04	0.0E+00	5.0E-03	L

END

Table E.4-1.1c
Intermediate Calculations Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 2-Hexanone - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1	0.274	0.245	1.26E-09	0.865	1.09E-09	4,000	2.00E+00	1.69E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	9,980	3.82E-05	1.64E-03	1.75E-04	4.90E-03	1

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	2.96E-02	2.29E+01	0.10	8.33E+01	4.90E-03	4.00E+02	2.98E+184	4.84E-03	1.11E-01

Unit risk factor, URF $(µg/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
NA	5.0E-03

END

Table E.4-1.1d
Results Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 2-Hexanone - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	2.51E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.1E-02

MESSAGE SUMMARY BELOW:

END

Table E.4-1.2a
Data Entry Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 4-Methyl-2-Pentanone - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SL-SCREEN Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
108101	9.56E+00	Methylisobutylketone (4-methyl-2-pentanone)

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	15	10	CL		

MORE ↓

ENTER Vandose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
CL	1.48	0.442	0.168	0.002	5

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

END

Table E.4-1.2b
Chemical Properties Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 4-Methyl-2-Pentanone - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
7.50E-02	7.80E-06	1.38E-04	25	8,243	389.50	571.00	9.06E+00	1.90E+04	0.0E+00	3.0E+00	L

END

Table E.4-1.2c
Intermediate Calculations Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 4-Methyl-2-Pentanone - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R ($\mu g/kg$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1	0.274	0.245	1.26E-09	0.865	1.09E-09	4,000	9.56E+00	1.69E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	9,862	5.70E-05	2.45E-03	1.75E-04	5.19E-03	1

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)
15	1.81E-02	1.78E+02	0.10	8.33E+01	5.19E-03	4.00E+02	1.54E+174	4.84E-03	8.59E-01

Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
NA	3.0E+00

END

Table E.4-1.2d
Results Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 4-Methyl-2-Pentanone - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	2.51E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.7E-04

MESSAGE SUMMARY BELOW:

END

Table E.4-1.3a
Data Entry Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Chloromethane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SL-SCREEN Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
74873	1.17E+00	Methyl chloride (chloromethane)

MORE

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	15	10	CL		

MORE

ENTER Vandose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
CL	1.48	0.442	0.168	0.002	5

MORE

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

END

Table E.4-1.3b
Chemical Properties Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Chloromethane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
1.26E-01	6.50E-06	8.80E-03	25	5,115	249.00	416.25	2.12E+00	5.33E+03	1.0E-06	9.0E-02	L

END

Table E.4-1.3c
Intermediate Calculations Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Chloromethane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1	0.274	0.245	1.26E-09	0.865	1.09E-09	4,000	1.17E+00	1.69E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} ($atm-m^3/mol$)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	4,747	5.76E-03	2.48E-01	1.75E-04	8.65E-03	1

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	4.24E-03	1.77E+03	0.10	8.33E+01	8.65E-03	4.00E+02	3.48E+104	4.87E-03	8.63E+00

Unit risk factor, URF $(µg/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
1.0E-06	9.0E-02

END

Table E.4-1.3d
Results Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Chloromethane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	8.71E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
3.5E-06	9.2E-02

MESSAGE SUMMARY BELOW:

END

Table E.4-1.4a
Data Entry Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Cyclohexane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SL-SCREEN Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
110827	4.08E+01	Cyclohexane

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	15	10	CL		

MORE ↓

Lookup Soil Parameters

ENTER Vandose zone SCS soil type	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
CL	1.48	0.442	0.168	0.002	5

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

END

Table E.4-1.4b
Chemical Properties Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Cyclohexane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
8.39E-02	9.10E-06	1.95E-01	25	7,597	353.70	553.00	6.35E+02	5.50E+01	0.0E+00	6.0E+00	L

END

Table E.4-1.4c
Intermediate Calculations Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Cyclohexane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1	0.274	0.245	1.26E-09	0.865	1.09E-09	4,000	4.08E+01	1.69E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	8,466	9.15E-02	3.94E+00	1.75E-04	5.76E-03	1

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.27E+00	7.60E+04	0.10	8.33E+01	5.76E-03	4.00E+02	1.01E+157	4.85E-03	3.69E+02

Unit risk factor, URF ($(µg/m^3)^{-1}$)	Reference conc., RfC (mg/m^3)
NA	6.0E+00

END

Table E.4-1.4d
Results Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Cyclohexane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.16E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	5.9E-02

MESSAGE SUMMARY BELOW:

END

Table E.4-1.5a
Data Entry Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Methylcyclohexane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SL-SCREEN Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
108872	1.05E+02	Methylcyclohexane

MORE

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	15	10	CL		

MORE

ENTER Vandose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
CL	1.48	0.442	0.168	0.002	5

MORE

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

END

Table E.4-1.5b
Chemical Properties Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Methylcyclohexane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
7.35E-02	8.52E-06	1.03E-01	25	7,474	373.90	572.20	7.85E+01	1.40E+01	0.0E+00	3.0E+00	L

END

Table E.4-1.5c
Intermediate Calculations Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Methylcyclohexane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1	0.274	0.245	1.26E-09	0.865	1.09E-09	4,000	1.05E+02	1.69E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	8,584	4.77E-02	2.05E+00	1.75E-04	5.05E-03	1

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.57E-01	3.31E+05	0.10	8.33E+01	5.05E-03	4.00E+02	1.66E+179	4.84E-03	1.60E+03

Unit risk factor, URF $(µg/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
NA	3.0E+00

END

Table E.4-1.5d
Results Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Methylcyclohexane - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	9.11E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	5.1E-01

MESSAGE SUMMARY BELOW:

END

Table E.4-2.1a
Data Entry Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 4-Methyl-2-Pentanone - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SL-SCREEN Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
108101	1.11E+01	Methylisobutylketone (4-methyl-2-pentanone)

MORE

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	15	10	CL		

MORE

ENTER Vandose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
CL	1.48	0.442	0.168	0.002	5

MORE

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1

Used to calculate risk-based soil concentration.

END

Table E.4-2.1b
Chemical Properties Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 4-Methyl-2-Pentanone - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
7.50E-02	7.80E-06	1.38E-04	25	8,243	389.50	571.00	9.06E+00	1.90E+04	0.0E+00	3.0E+00	L

END

Table E.4-2.1c
Intermediate Calculations Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 4-Methyl-2-Pentanone - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1	0.274	0.245	1.26E-09	0.865	1.09E-09	4,000	1.11E+01	1.69E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	9,862	5.70E-05	2.45E-03	1.75E-04	5.19E-03	1

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.81E-02	2.06E+02	0.10	8.33E+01	5.19E-03	4.00E+02	1.54E+174	4.84E-03	9.98E-01

Unit risk factor, URF $(µg/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
NA	3.0E+00

END

Table E.4-2.1d
Results Sheet
Johnson and Ettinger Model
Soil to Indoor Air - 4-Methyl-2-Pentanone - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	2.51E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	3.2E-04

MESSAGE SUMMARY BELOW:

END

Table E.4-2.2a
Data Entry Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Cyclohexane - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SL-SCREEN Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
110827	4.00E+00	Cyclohexane

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	15	10	CL		

MORE ↓

ENTER Vandose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
CL	1.48	0.442	0.168	0.002	5

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1

Used to calculate risk-based soil concentration.

END

Table E.4-2.2b
Chemical Properties Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Cyclohexane - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
8.39E-02	9.10E-06	1.95E-01	25	7,597	353.70	553.00	6.35E+02	5.50E+01	0.0E+00	6.0E+00	L

END

Table E.4-2.2c
Intermediate Calculations Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Cyclohexane - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1	0.274	0.245	1.26E-09	0.865	1.09E-09	4,000	4.00E+00	1.69E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	8,466	9.15E-02	3.94E+00	1.75E-04	5.76E-03	1

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.27E+00	7.45E+03	0.10	8.33E+01	5.76E-03	4.00E+02	1.01E+157	4.85E-03	3.61E+01

Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
NA	6.0E+00

END

Table E.4-2.2d
Results Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Cyclohexane - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.16E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	5.8E-03

MESSAGE SUMMARY BELOW:

END

Table E.4-2.3a
Data Entry Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Methylcyclohexane - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SL-SCREEN Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
108872	2.65E+01	Methylcyclohexane

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	15	10	CL		

MORE ↓

ENTER Vandose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)
CL	1.48	0.442	0.168	0.002

ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)

5

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1

Used to calculate risk-based soil concentration.

END

Table E.4-2.3b
Chemical Properties Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Methylcyclohexane - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
7.35E-02	8.52E-06	1.03E-01	25	7,474	373.90	572.20	7.85E+01	1.40E+01	0.0E+00	3.0E+00	L

END

Table E.4-2.3c
Intermediate Calculations Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Methylcyclohexane - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1	0.274	0.245	1.26E-09	0.865	1.09E-09	4,000	2.65E+01	1.69E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} ($atm-m^3/mol$)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	8,584	4.77E-02	2.05E+00	1.75E-04	5.05E-03	1

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)
15	1.57E-01	8.36E+04	0.10	8.33E+01	5.05E-03	4.00E+02	1.66E+179	4.84E-03	4.05E+02

Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
NA	3.0E+00

END

Table E.4-2.3d
Results Sheet
Johnson and Ettinger Model
Soil to Indoor Air - Methylcyclohexane - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	9.11E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.3E-01

MESSAGE SUMMARY BELOW:

END

Table E.4-3a
Data Entry Sheet
Johnson and Ettinger Model
Groundwater to Indoor Air - Chloroform
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

GW-SCREEN Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
67663	2.40E+01	Chloroform

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	2743	CL	10	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
CL			CL	1.48	0.442	0.168

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

Table E.4-3b
Chemical Properties Sheet
Johnson and Ettinger Model
Groundwater to Indoor Air - Chloroform
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	0.0E+00

END

Table E.4-3c
Intermediate Calculations Sheet
Johnson and Ettinger Model
Groundwater to Indoor Air - Chloroform
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2728	0.274	0.245	1.26E-09	0.865	1.09E-09	46.88	0.442	0.067	0.375	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)
1.69E+04	1.00E+06	4.00E-04	15	7,554	1.86E-03	8.02E-02	1.75E-04	7.14E-03	8.96E-05	3.04E-03

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
2728	15	1.92E+03	0.10	8.33E+01	7.14E-03	4.00E+02	4.28E+126	6.48E-05	1.25E-01	2.3E-05	NA

Table E.4-3d
Results Sheet
Johnson and Ettinger Model
Groundwater to Indoor Air - Chloroform
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	7.92E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.2E-06	NA

MESSAGE SUMMARY BELOW:

END

APPENDIX F

ECOLOGICAL RISK ASSESSMENT

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APPENDIX F.1

SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT PROCESS

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APPENDIX F.1
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT PROCESS
SWMUs 40 and 71 RFI/CMS REPORT

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LIST OF ABBREVIATIONS AND ACRONYMS

% ..... Percent
ADD..... Average Daily Dose
AF ..... Area Use Factor
BAF..... Bioaccumulation Factor
BTAG..... Biological Technical Assistance Group
BW ..... Body Weight
C_{TRV}..... NOAEL- or LOAEL-based TRV concentration
COPC ..... Chemical of Potential Concern
COPEC..... Chemical of Potential Ecological Concern
DF ..... Dietary Fraction
DW:WW ..... Dry weight to wet weight
ECO-SSL ..... Ecological Soil Screening Level
EF..... Extrapolation Factor
EPC ..... Exposure Point Concentration
HQ..... Hazard Quotient
IR ..... Ingestion Rate
kg ..... Kilogram
LD_{50}..... Lethal Dose to 50% of the test population
LOAEL ..... Lowest Observable Adverse Effects Level
MDC ..... Maximum Detected Concentration
mg ..... Milligram
mg/kg ..... Milligrams Per Kilogram
NOAEL..... No Observable Adverse Effects Level
ORNL..... Oak Ridge National Laboratory
PAH ..... Polynuclear Aromatic Hydrocarbon
SLERA..... Screening Level Ecological Risk Assessment
2,3,7,8 TCDD.... 2,3,7,8-tetrachlorodibenzo-p-dioxin
TEF ..... Toxicity Equivalence Factor
TEQ..... Toxicity Equivalent
TOC ..... Total Organic Carbon
TRV ..... Toxicity Reference Value
UF ..... Uncertainty Factor
UF_{plant} ..... Plant Uptake Factor
USACHPPM..... U.S. Army Center for Health Promotion and Preventive Medicine
USEPA..... U.S. Environmental Protection Agency

1.0 INTRODUCTION

The purpose of this appendix is to present and describe development of exposure assessment models for the receptors presented in Section 7.0, the Screening Level Ecological Risk Assessment (SLERA) at SWMUs 40 and 71. The following sections provide a summary of parameters used in the models and a detailed description of the direct contact and dose rate modeling approachs used in the SLERA. The complete SLERAs for SWMU 40 and SWMU 71 are presented in Appendices F.2 and F.3, respectively.

2.0 MODEL PARAMETERS

The direct contact and dose rate models include parameters relating to receptor-specific exposure, chemical of potential concern (COPC) toxicity, and bioaccumulation rates. The following sections describe the estimation of these parameters and major assumptions of parameterization.

2.1 TOXICITY REFERENCE VALUES

MDCs for detected chemicals in soil are used as the preliminary exposure estimate to evaluate a conservative risk scenario for the direct contact pathway to soil invertebrates. Other potentially complete exposure pathways to soil invertebrate and microbial communities include direct ingestion of soil and biota. Due to insufficient information to quantify these pathways, likely secondary to the direct contact/absorption pathway, their omission should not substantially alter the risk characterization.

To evaluate the preliminary exposure estimates, the Toxicity Reference Values (TRVs) that were protective of terrestrial plants and soil invertebrate/microbial communities, were selected from a review of toxicological benchmarks for soil. TRVs for direct contact of soil to invertebrates/microbes and soil to plants were determined from the following guidance:

- USEPA Ecological Soil Screening Level (ECO-SSL): soil invertebrate and plant;
- Oak Ridge National Laboratory (ORNL): plant, microbial community, earthworm values (Efroymson *et al*. 1997a, Efroymson *et al*. 1997b, Efroymson *et al*. 1997c); and
- USEPA Region III Biological Technical Assistance Group (BTAG) soil screening values (USEPA 1995), BTAG freshwater screening benchmarks (USEPA 2006a), and BTAG freshwater sediment screening levels (USEPA 2006b)

Selected screening levels and sources are reported on Tables F.2-5 (SWMU 40) and F.3-5 (SWMU 71) for terrestrial plants and Tables F.2-7 (SWMU 40) and F.3-7 (SWMU 71) for soil invertebrates and microbial communities.

2.2 RECEPTOR-SPECIFIC EXPOSURE PARAMETERS

Wildlife receptors selected to characterize exposure at SWMUs 40 and 71 include:

- Herbivorous mammals: Meadow Vole (*Microtus pennsylvanicus*);
- Invertivorous mammals: Short-tailed Shrew (*Blarina brevicauda*);
- Invertivorous birds: American Robin (*Turdus migratorius*);
- Carnivorous birds: Red-tailed Hawk (*Buteo jamaicensis*); and
- Carnivorous mammals: Red Fox (*Vulpes vulpes*).

Exposure parameters used to derive TRV-based substrate concentrations for each receptor include body weight (kg), food ingestion rate (kg dry weight/day), dietary fraction, incidental substrate ingestion rate (kg dry weight/day), and area use factor. Both preliminary and refinement level exposure parameters are presented in Table F.2-9 (SWMU 40) and Table F.3-9 (SWMU 71).

2.3 LITERATURE-BASED NOAEL AND LOAEL VALUES

The dose-response relationships for chemicals of potential concern are expressed as NOAELs and LOAELs for wildlife receptors, which are defined as a daily ingested amount (mg/kg body weight-day) that is associated with a specified effect. This process involves the determination of a "test species dose" for a critical endpoint from a particular experimental combination of exposure concentration, exposure duration, test species, and chemical. Endpoints may be based on growth, reproductive, developmental, and survival effects. Such effects are important because they may affect the abundance or reproductive success of receptor populations. The test-species dose from the selected study is then modified using extrapolation and uncertainty factors (EFs and UFs).

For this evaluation, EFs and UFs are used to modify laboratory study results, based on the methodology of Sample et al. (1996). This process involves the determination of a "test species dose" for a critical endpoint from a particular experimental combination of exposure concentration, exposure duration, test species, and chemical. The test-species dose from the selected study is then modified to account for the various extrapolations and uncertainties inherent in applying results from a controlled setting to an ecologically relevant setting, as in:

$$\text{NOAEL or LOAEL} = \frac{\text{Test-Species Dose}}{\text{Duration UF} \times \text{Endpoint UF}} \times \text{Body-Weight EF}$$

EFs and UFs are based on: (1) the duration of exposure, (2) the endpoint measured, and (3) differences in body weights among test and receptor species (Calabrese and Baldwin 1993, Ford et al. 1992, Opresko et al. 1994, Sample et al. 1996, USEPA 1996, Wentsel et al. 1994). EFs and UFs derivation and use is described in the following subsections. The use of surrogate chemical data is also discussed. NOAEL and LOAELs for COPCs are summarized in Table F.2-10 (SWMU 40) and Table F.3-10 (SWMU 71).

2.3.1 The Test-Species Dose

Critical toxicological values are identified from carefully qualified primary and secondary literature references. The selection of particular studies and endpoints used for the derivation of NOAELs and LOAELs is based on the evaluation of the applicable studies and the dose-response data contained therein. In cases where preferred toxicological endpoints are not available, other toxicity values are used, but additional uncertainty factors may be incorporated. All toxicological values chosen for NOAEL and LOAEL derivation are presented on a mg chemical per kg body weight per day (mg/kg BW-day) basis. These units allow comparisons among organisms of different body sizes (Sample et al. 1996).

2.3.2 Duration Uncertainty Factors

Exposure durations of interest include (1) chronic, (2) subchronic, and (3) acute. Chronic studies occur over the lifetime or a majority of the lifespan of the test organism, generally longer than one year for mammals and 10 weeks for birds. Additionally, studies in which the test organism is dosed during a critical life stage (e.g., gestation) are included with chronic duration studies. Subchronic studies include exposures of two weeks to one year in duration that do not occur during a critical life stage. Acute studies typically have exposures of less than two weeks. NOAELs and LOAELs are usually reported from chronic and subchronic studies, with acute studies often reporting LD_{50} levels (LD_{50}; doses corresponding to the overt expression of a serious adverse effect such as mortality in 50% of test animals). Test-species doses from chronic studies are used preferentially over data from acute and subchronic studies. In cases where chronic data are not available as test-species doses, studies involving less-than-chronic exposures are used to in NOAEL and LOAEL derivation with the addition of a duration uncertainty factor.

For this study, duration uncertainty factors are applied according to USACHPPM 2000:

- Subchronic NOAEL to Chronic NOAEL: 10
- Subchronic LOAEL to Chronic NOAEL: 20

- Subchronic LOAEL to Chronic LOAEL: 4
- Acute NOAEL to Chronic NOAEL: 30
- Acute LOAEL to Chronic NOAEL: 50
- Acute LOAEL to Chronic LOAEL: 10

2.3.3 Endpoint Uncertainty Factors

Additional UFs are used to account for uncertainties in extrapolation between effect- and no-effect levels. Specifically, a NOAEL test-species dose may be estimated from a LOAEL (or LD_{50}) value, or a LOAEL may be estimated from a LD_{50}.

Extrapolation from a LOAEL or LD_{50t} to a NOAEL: Consistent with USACHPPM 2000, a UF of 10 is used with chronic LOAEL values to estimate the chronic NOAEL, which is considered conservative (Sample et al. 1996, USEPA 1996). When a LOAEL value is not available, a LD_{50} is used, although chronic NOAELs may range from 1/10 to 1/10,000 of the corresponding acute LD_{50} value (Opresko et al. 1994). For this report, an uncertainty factor of 100 is used to estimate a NOAEL value from a LD_{50} value (USACHPPM 2000).

Extrapolation from an LD_{50} to a LOAEL: Consistent with USACHPPM 2000, an UF of 20 is used conservatively to estimate a LOAEL value from a LD_{50} value (USACHPPM 2000).

2.3.4 Body-Weight Extrapolation Factor

This extrapolation is accomplished using a body weight-scaling factor to account for differences in body size (Sample et al. 1996). Numerous studies have shown that many physiological functions such as metabolic rates and responses to chemicals are a function of body size for mammals. Smaller mammals have higher metabolic rates and are usually more resistant to chemicals because of more rapid rates of detoxification. It has been shown that the best measure of body size is one based on body surface-area, which can be expressed in terms of body weight raised to a fractional power (Opresko et al. 1994, Sample et al. 1996, USEPA 1980). Dosimetric differences between the mammalian test species and wildlife receptors are accounted for using:

$$\mathrm{NOAEL}_w = \mathrm{NOAEL}_t \times \left(\frac{\mathrm{BW}_t}{\mathrm{BW}_w} \right)^{0.25}$$

where:

$NOAEL_w$	= NOAEL for the mammalian wildlife receptor (mg/kg BW-day)
$NOAEL_t$	= NOAEL for the mammalian test species (mg/kg BW-day)
BW_t	= Test species body weight (kg)
BW_w	= Wildlife receptor body weight (kg)

Scaling factors may not be appropriate for avian interspecies extrapolations. Information has shown that adjustment factors based on body size for interspecies extrapolation among avian species range from 0.63 to 1.55 (Sample et al. 1996). Therefore, a body-weight extrapolation factor is not used to derive avian NOAELs and LOAELs.

Mammalian wildlife receptor body weights are presented on Tables F.2-9 (SWMU 40) and F.3-9 (SWMU 71) and laboratory test species body weights are presented on Tables F.2-10 (SWMU 40) and F.3-10 (SWMU 71).

2.4 BIOACCUMULATION FACTORS

Bioaccumulation factors (BAFs) provide quantitative indicators of the tendency for a chemical to partition into terrestrial organisms, relative to the concentrations present in terrestrial exposure media. Exposure-point concentrations of chemicals in terrestrial prey (soil invertebrates and small mammals) and terrestrial plants are estimated using BAFs derived from the literature. The derivation of BAFs is described for organic and inorganic chemicals in the following subsections.

2.4.1 Terrestrial Plants

Exposure-point concentrations of chemicals in terrestrial plants are estimated using soil-to-plant bioaccumulation factors (uptake factors for plants, UF_{plant}) derived from the literature. UF_{plant} values are used to estimate wet-weight chemical concentrations in terrestrial plants using the same equation for invertebrates and a dry weight to wet weight conversion factor assuming plants are 80% water (Salisbury and Ross 1992). Tables F.2-11 (SWMU 40) and F.3-11 (SWMU 71) present the uptake factors for plants.

Organic Chemicals: Organic chemicals may enter the plant by partitioning from contaminated soil to the roots and then translocating throughout the plant via the xylem tissue. Most bioaccumulative, lipophilic organic chemicals partition to the epidermis of the root or adhere to soil particles and are not drawn into the inner root or xylem (Paterson et al. 1990). Uptake factors for estimating concentrations of organic chemicals in plant tissues are derived from the following equation:

$$UF_{plant} = 10^{[1.588-(0.578\times \log K_{ow})]}$$

where:

UF_{plant} = Plant uptake factor (kg soil, dry weight / kg plant, dry weight)

$\log K_{ow}$ = Logarithm of the octanol:water partition coefficient

This relationship is based on a linear regression of bioaccumulation factors for 29 organic chemicals (Travis and Arms 1988). The correlation coefficient for the regression is 0.73, indicating that a majority of the variability in bioaccumulation is explained by the log K_{ow}. UF_{plant} values are derived for organic chemicals using this equation.

Inorganic Chemicals: Concentrations of inorganic chemicals in plant tissues are estimated based on generalized soil-to-plant transfer coefficients reported in a literature review. The soil-to-plant transfer factors for inorganic chemicals are equivalent to UF_{plant} values for organic chemicals and represent the ratio of the dry weight concentrations in plant tissue to the dry weight concentration of the element in root-zone soils. Bechtel-Jacobs 1998 C_p regression equation: $C_p = e^{(slope*\ln(Cs) - intercept)}$

2.4.2 Terrestrial Prey

Organic Chemicals: BAFs for estimating concentrations of organic chemicals in prey tissues are derived from linear regression equations presented in Travis and Arms (1998) and Beyer and Stafford (1993). The dry weight to wet weight (DW:WW) conversion factor is 0.2 for soil invertebrates (kg soil invertebrate dry weight per soil invertebrate wet weight; assumes invertebrates are 80% water), based on data reported in USEPA (1993). No DW:WW conversion factor was applied for small mammals. The BAF values used in to estimate concentrations of organic chemicals in soil invertebrates and small mammals are shown in Tables F.2-12 and F.2-13 (SWMU 40) and F.3-12 and F.3-13 (SWMU 71).

Inorganic Chemicals: Inorganic bioaccumulation factors for terrestrial prey (Tables F.2-13 and F.3-13) are wet-weight-based and are used to predict concentrations in invertebrates and small mammals according to:

$$BAF_{si} = C_{si} / C_{soil}$$

where:

BAF_{si} = Soil invertebrate uptake factor for inorganic chemicals

C_{si} = Chemical concentration predicted in soil invertebrates (mg chemical / kg soil invertebrate, dry weight)

C_{soil} = Concentration of inorganic chemical in soil (mg chemical / kg soil, dry weight)

2.5 TOXICITY EQUIVALENCY FACTORS

Dioxin/furan COPCs represent a group of 17 polychlorinated dioxin/furan congeners of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). These congeners induce toxicity by binding to the aryl hydrocarbon (Ah) receptor, a cellular protein. All congeners are not equally toxic relative to TCDD (USEPA 1999). Therefore, the toxicity of each congener relative to TCDD is expressed in terms of a Toxicity Equivalency Factor (TEFs) established for mammals, birds, and fish (Van den Berg et. all 1998). The aggregate toxicity of a mixture of dioxins/furans in an exposure medium is expressed as TCDD-equivalents ($TEQ_{2,3,7,8\ TCCD}$), which are calculated as the TEF-weighted sum of the average daily dose (ADD_i) of the 17 congeners. $TEQ_{2,3,7,8\ TCCD}$ is calculated as follows:

$$TEQ_{2,3,7,8TCDD} = \sum_{i=1}^{17} ADD_i \times TEF_i$$

Determining the aggregate toxicity of the 17 dioxin/furan congeners in terms of $TEQ_{2,3,7,8\ TCCD}$ enables direct comparison to toxicological benchmarks developed for 2,3,7,8 TCDD (USEPA 1999). Therefore, NOAELs and LOAELs derived in the literature are used for direct evaluation of ecological effects resulting from $TEQ_{2,3,7,8\ TCCD}$ exposure.

Tables F.2-2 and F.3-2 present the total 2,3,7,8 TCDD TEQs calculated for SWMUs 40 and 71, respectively.

3.0 DIRECT CONTACT APPROACH

3.1 PRELIMINARY DIRECT CONTACT TOXICITY EVALUATION

Risk is assessed by comparing the preliminary exposure estimate (maximum detected concetrations - MDC) of each detected chemical to the established TRV (detailed in Section 2.1). The preliminary risk is characterized in terms of a hazard quotient (HQ), which is expressed as:

HQ = MDC/TRV

where:

HQ = Hazard Quotient for the contaminant (unitless)
MDC = Maximum Detected Concentration for contaminant (mg/kg)
TRV = Screening Level for contaminant (mg/kg)

3.2 REFINED DIRECT CONTACT TOXICITY EVALUATION

For the refined evaluation, risk is assessed by comparing the exposure point concentration (EPC) of each detected chemical to the TRV (Section 7.1.6 details EPC development). The refined risk HQ is expressed as:

HQ = EPC/TRV

where:

HQ = Hazard Quotient for the contaminant (unitless)
EPC = Calculated Exposure Point Concentration for contaminant (mg/kg)
TRV = Screening Level for contaminant (mg/kg)

An HQ of less than 1 indicates no or negligible risk. The potential for risk increases as the HQ increases above unity. However, this result should be considered in the context of other characteristics of the exposure area.

Results of the direct contact toxicity evaluation for SWMU 40 are presented in Tables F.2-6 (terrestrial plants) and F.2-8 (soil and microbial communities) and SWMU 71 results are presented in Tables F.3-6 (terrestrial plants) and F.3-8 (soil and microbial .

4.0 DOSE RATE MODELING APPROACH

A simplified food web model is utilized to calculate TRVs for each chemical and wildlife receptor. TRVs quantify COPC concentrations in exposure media that may result in no observable adverse effects or low observable adverse effects. The NOAEL corresponds to the greatest exposure associated with no observed adverse effects on growth, reproduction, or survival. The LOAEL corresponds to the smallest exposure associated with observed adverse effects on growth, reproduction or survival. TRVs developed by dose rate models are used to evaluate ecological effects associated with COPEC concentrations in exposure media.

4.1 PRELIMINARY DOSE RATE MODEL

Preliminary risk characterization for wildlife receptors uses the conservative preliminary exposure estimate and ecological effects evaluation to characterize risk to potential terrestrial receptors.

The simplified food web model considers the ingestion of prey, the incidental ingestion of media, and the primary routes of exposure to wildlife receptors. Chemical concentrations in prey are expressed as a function of chemical concentrations in exposure media using BAFs for terrestrial prey items. Other important parameters in the model include receptor body weight and an estimate of receptor use. As shown in the equation below, literature-derived NOAEL and LOAEL values are input into the model as the ADD variable to calculate the concentration in exposure media (C_{TRV}) that would result in a dose equivalent to a NOAEL or LOAEL.

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \ (BAF_{food} \cdot DF) + IR_s)AF}$$

where:

C_{TRV} = NOAEL or LOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg COPC/kg body weight-day)

BW = Minimum Body Weight of the receptor (kg)

IR_{food} = Maximum Ingestion Rate of food (kg food ingested per day, dry weight)

BAF_{food} = BAF of most contaminated dietary component used, specific to prey type and COPC (ratio of mg of COPC/kg fauna, wet weight to mg COPC/ kg substrate, dry weight)

DF = Dietary Fraction (most contaminated dietary component assumed to be 100% of diet)

IR_s = Maximum Incidental Ingestion Rate of soil (kg substrate ingested per day, dry weight)

AF = 100% Area Use Factor

Preliminary receptor parameters for SWMUs 40 and 71 are presented on Tables F.2-9 and F.3-9, respectively. The resulting risk is characterized in terms of an HQ and is presented for wildlife receptors in Appendix F.2 and summarized in Table F.2-24 for SWMU 40 and in Appendix F.3 and summarized in Table F.3-24 for SWMU 71.

4.2 REFINED EXPOSURE ESTIMATE AND RISK CHARACTERIZATION

The refined exposure and risk characterization, Step 3a of the ecological risk assessment guidance (ERAGS), reviews and refines the conservative assumptions used in the risk calculation (USEPA 1997). In Step 3a, conservative assumptions used in the preliminary exposure and risk characterization are replaced with more environmentally realistic assumptions to evaluate risk posed by COPECs identified in the preliminary risk characterization. The addition of Step 3a focuses the outcome of the ecological screening, streamlines the review process and functions as the initial basis for ecological risk management decision-making at each site.

4.3 REFINED DOSE RATE MODEL

This step replaces the conservative assumptions used in the preliminary exposure estimate and ecological effects evaluation with more environmentally realistic assumptions including the use of average body weight, average food and substrate ingestion rates, and the use of realistic area use factor, resulting in a more realistic estimate of potential risk.

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + IR_s)AF}$$

where:

C_{TRV} = NOAEL or LOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg COPC/kg body weight-day)

BW = Average Body Weight of the receptor (kg)

IR_{food} = Average Ingestion Rate of food (kg food ingested per day, dry weight)

BAF_{food} = BAF of dietary component used, specific to prey type and COPC (ratio of mg of COPC/kg fauna, wet weight to mg COPC/ kg substrate, dry weight)

DF = Dietary Fraction

IR_s = Average Incidental Ingestion Rate of soil (kg substrate ingested per day, dry weight)

$AF_{refined}$ = Refined Area Use Factor (detailed below)

In the refined model, a realistic area use factor ($AF_{refined}$) was used to calculate the ratio of the study area (2 acres) to the average home range of the receptor:

$$AF_{refined} = \text{Study Area/Home Range Area}$$

Other receptor parameters in the refined model remain conservative. The conservative assumptions are summarized as follows:

- Receptors assimilate 100% of COPECs detected in the food and soil; and
- Receptors forage in the site area 100% of the time.

Refined receptor parameters for SWMU 40 and SWMU 71 are presented on Tables F.2-9 and F.3-9, respectively. The resulting risk is characterized in terms of an HQ and is presented for wildlife receptors in Appendix F.2 and summarized in Table F.2-24 for SWMU 40 and in Appendix F.3 and summarized in Table F.3-24 for SWMU 71.

4.4 EXAMPLE C_{TRV} EQUATION CALCULATION – PRELIMINARY AND REFINED

The following example C_{TRV} equation details the arsenic NOAEL-based screening level (SL) calculated for the short-tailed shrew at SWMU 40 (Tables F.2-16 and F.2-17) and resulting HQs:

Preliminary

- ADD = 0.15 mg/kg bw-day (NOAEL)
- BW = 0.0125 kg (minimum body weight)
- IR_{food} = 0.003 kg dw/day (maximum ingestion rate)
- BAF_{food} = 1.1 (for the most contaminated dietary component in this case plant)
- DF = 1 (100% most contaminated dietary component in this case 100% plants)
- IR_{soil} = 0.00031 kg dw/day (maximum soil ingestion rate)
- AF = 1 (default used)

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}\ (BAF_{food} \cdot DF) + IR_s)AF} = \frac{0.15 \cdot 0.0125}{(0.003\,(1.1 \cdot 1) + 0.00031) \cdot 1} = \textbf{5.2E-01 mg/kg}$$

NOAEL HQ = MDC (mg/kg)/NOAEL-based SL (mg/kg) = $\frac{55}{5.2E-01}$ = **1.1E+02**

EPC NOAEL HQ = NOAEL HQ * (EPC (mg/kg) / MDC (mg/kg)) = 1.1E+02*($\frac{25.61}{55}$) = **4.9E+01**

Refined

- ADD = 0.15 mg/kg bw-day
- BW = 0.015 kg
- IR_{food} = 0.002 kg dw/day
- BAF_{plant} = 0.038
- BAF_{inv} = 0.00931
- DF_{plant} = 0.14
- DF_{inv} = 0.86
- IR_{soil} = 0.00021 kg dw/day
- $AF_{refined}$ = 1

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF_{food}) + IR_s)AF}$$

$$= \frac{0.15 \cdot 0.015}{(0.002\,(0.038 \cdot 0.14 + 0.00931 \cdot 0.86) + 0.00021) \cdot 0.59} = \textbf{5.9+00 mg/kg}$$

NOAEL HQ = EPC (mg/kg)/NOAEL-based SL (mg/kg) = $\frac{25.61}{5.9E+00}$ = **4.3E+00**

Tables F.2-24 and F.3-24 provides a summary of preliminary and refined HQs developed for terrestrial receptors at SWMUs 40 and 71, respectively.

5.0 SUMMARY

Receptor-specific exposure parameters are obtained from life history studies found in the literature. Important receptor-specific exposure parameters input into the model include: body weight, food ingestion rate, diet composition, incidental substrate ingestion rate, and area use factor.

The dose-response relationships for chemicals of potential interest are expressed as NOAELs and LOAELs for wildlife receptors, which are defined as a daily ingested amount (mg COPC/kg body weight-day) that is associated with a specified growth, reproductive, developmental, or survival effect. Extrapolation and uncertainty factors are applied to literature-based toxicological endpoints to account for differences in a controlled laboratory setting and an ecologically relevant setting. Extrapolation and uncertainty factors are based on: (1) the duration of exposure, (2) the endpoint measured, and (3) differences in body weights among test and receptor species.

Bioaccumulation accumulation factors provide quantitative indicators of the tendency for a chemical to partition into organisms, relative to the concentrations present in exposure media. Exposure-point concentrations of chemicals in terrestrial prey (soil invertebrates and small mammals) are estimated using several BAFs derived from the literature.

COPC concentrations in prey and media, receptor-specific exposure parameters, literature-based NOAEL and LOAEL values, and bioaccumulation factors are used in the model to calculate the concentration in exposure media (C_{TRV}) that would result in a dose equivalent to a NOAEL or LOAEL. The dose rate modeling approach is used to evaluate the potential mobility of COPCs through varying trophic associations.

6.0 REFERENCES

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APPENDIX F.2

SWMU 40 SLERA

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Table F.2-1
SLERA Occurence/Distribution - SWMU 40 Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
TAL Metals (mg/kg)							
Aluminum	7429-90-5	659	28,500	mg/kg	40SB4A	19/19	1.6 - 11.3
Antimony	7440-36-0	0.46	1.3	mg/kg	71SB14A	15/18	0.036 - 1.1
Arsenic	7440-38-2	1.3	55	mg/kg	71SB14A	19/19	0.023 - 1.1
Barium	7440-39-3	14.6	191	mg/kg	40SB3A	19/19	0.02 - 1.1
Beryllium	7440-41-7	0.24	1.5	mg/kg	40SB4A	19/19	0.01 - 0.57
Cadmium	7440-43-9	0.09	0.75	mg/kg	40SB1A	8/19	0.0073 - 0.57
Calcium	7440-70-2	457	26,300	mg/kg	40SB10A	19/19	1.1 - 113
Chromium	7440-47-3	4.1	37.6	mg/kg	40SS3	19/19	0.07 - 0.57
Cobalt	7440-48-4	1.8	13.2	mg/kg	40SB3A	19/19	0.07 - 0.57
Copper	7440-50-8	2.1	76	mg/kg	71SB14A	18/19	0.045 - 0.57
Iron	7439-89-6	1,440	32,000	mg/kg	40SB1A	19/19	1.4 - 23
Lead	7439-92-1	3.8	110	mg/kg	71SB14A	19/19	0.041 - 0.34
Magnesium	7439-95-4	120	24,400	mg/kg	40SB4A	19/19	0.69 - 113
Manganese	7439-96-5	10.7	894	mg/kg	40SS1	19/19	0.02 - 1.1
Mercury	7439-97-6	0.042	2.1	mg/kg	40SB1A	18/19	0.0048 - 0.039
Nickel	7440-02-0	4.3	20.9	mg/kg	40SB4A	19/19	0.027 - 0.57
Potassium	7440-09-7	89.2	5240	mg/kg	40SB4A	19/19	4.5 - 113
Selenium	7782-49-2	0.475	3.3	mg/kg	40SB1A	18/19	0.063 - 0.57
Silver	7440-22-4	0.071	0.2	mg/kg	40SB1A	4/19	0.017 - 0.57
Sodium	7440-23-5	86.8	370	mg/kg	71SB14A	19/19	19 - 226
Thallium	7440-28-0	0	1.3	mg/kg	71SB14A	2/14	0.0085 - 1.1
Vanadium	7440-62-2	5.4	56.9	mg/kg	40SB9A	19/19	0.024 - 2.3
Zinc	7440-66-6	5.5	148	mg/kg	40SB1A	19/19	0.11 - 2.3
Pesticides/PCBs (ug/kg)							
4,4'-DDE	72-55-9	1.8E+00	1.8E+00	µg/kg	40SB10A	1/17	0.4 - 2.1
4,4'-DDT	50-29-3	7.7E+00	7.7E+00	µg/kg	40SS4	1/17	0.39 - 6.2
Aldrin	309-00-2	2.1E+00	5.1E+00	µg/kg	40SS4	2/17	0.17 - 1
alpha-Chlordane	5103-71-9	4.9E-01	3.2E+00	µg/kg	40SB10A	3/17	0.22 - 2.1
beta-BHC	319-85-7	2.1E+00	1.2E+01	µg/kg	40SB12A	5/17	0.28 - 2.1
Endosulfan Sulfate	1031-07-8	2.9E+01	2.9E+01	µg/kg	40SS4	1/17	0.4 - 4.1
Endrin	72-20-8	3.9E+00	3.9E+00	µg/kg	40SS4	1/17	0.35 - 4.1
Endrin Ketone	53494-70-5	2.4E+01	2.4E+01	µg/kg	40SS4	1/17	0.39 - 10
gamma-BHC (Lindane)	58-89-9	5.5E-01	1.1E+01	µg/kg	40SS4	2/17	0.22 - 1
gamma-Chlordane	5103-74-2	7.6E+00	7.6E+00	µg/kg	40SS4	1/17	0.35 - 1
Methoxychlor	72-43-5	4.3E+01	4.3E+01	µg/kg	40SS4	1/17	1.4 - 10
Aroclor 1248	12672-29-6	1.9E+02	1.9E+02	µg/kg	71SB15A DUP AVG	1/32	5.2 - 56
Aroclor 1254	11097-69-1	2.0E+01	2.1E+03	µg/kg	40SS1	28/32	5.5 - 56
Aroclor 1260	11096-82-5	1.3E+01	6.2E+02	µg/kg	40SS7	11/32	6.2 - 80
TCL VOCs (ug/kg)							
1,2,4-Trichlorobenzene	120-82-1	7.0E-01	7.0E-01	µg/kg	40SB12A	1/17	0.4 - 15
1,2-Dibromo-3-Chloropropane	96-12-8	4.0E-01	4.0E-01	µg/kg	40SB12A	1/17	0.2 - 15
1,2-Dichlorobenzene	95-50-1	4.0E-01	8.0E-01	µg/kg	40SS5	2/17	0.2 - 15
1,3-Dichlorobenzene	541-73-1	3.0E-01	9.0E-01	µg/kg	40SS5	2/17	0.2 - 15
1,4-Dichlorobenzene	106-46-7	5.0E-01	1.0E+00	µg/kg	40SS5	3/17	0.2 - 15
2-Butanone	78-93-3	6.0E+00	4.0E+01	µg/kg	40SS3	8/17	1 - 39
2-Hexanone	591-78-6	2.0E+00	2.0E+00	µg/kg	40SB12A	1/17	0.5 - 39
4-Methyl-2-Pentanone	108-10-1	3.0E+00	3.1E+01	µg/kg	40SB10A	10/17	0.5 - 39
Acetone	67-64-1	1.1E+01	4.6E+02	µg/kg	40SS3	16/17	0.9 - 39
Benzene	71-43-2	8.0E-01	6.0E+00	µg/kg	40SB10A	3/17	0.4 - 15
Bromomethane	74-83-9	3.0E+00	3.0E+00	µg/kg	40SB12A	1/17	0.9 - 15
Carbon Disulfide	75-15-0	1.0E+00	4.0E+00	µg/kg	40SS2	8/17	0.5 - 15
Chlorobenzene	108-90-7	4.0E-01	4.0E-01	µg/kg	40SB5A	1/17	0.2 - 15
Chloromethane	74-87-3	1.0E+00	3.0E+00	µg/kg	40SS5	2/17	0.9 - 15
Cyclohexane	110-82-7	3.0E+00	3.0E+00	µg/kg	40SB10A	2/17	0.4 - 15
Dichlorodifluoromethane	75-71-8	1.0E+00	3.0E+00	µg/kg	40SS5	4/17	0.4 - 15
Ethylbenzene	100-41-4	7.0E-01	1.7E+01	µg/kg	40SB10A	9/17	0.4 - 15
Isopropylbenzene	98-82-8	3.0E+00	3.0E+00	µg/kg	40SB10A	1/17	6 - 17
Methyl Acetate	79-20-9	1.4E+01	1.2E+02	µg/kg	40SS3	7/17	0.5 - 15
Methyl Tert-Butyl Ether	1634-04-4	2.0E+00	2.0E+00	µg/kg	40SB10A	1/17	6 - 17
Methylcyclohexane	108-87-2	1.0E+00	2.7E+01	µg/kg	40SS4	3/17	0.4 - 15
Methylene Chloride	75-09-2	7.0E-01	1.4E+01	µg/kg	40SS2	11/17	0.5 - 15
Styrene	100-42-5	8.0E-01	2.0E+00	µg/kg	40SS3	5/17	0.2 - 15
Tetrachloroethene	127-18-4	1.0E+00	1.0E+00	µg/kg	40SB12A	1/17	0.3 - 15
Toluene	108-88-3	8.0E-01	1.9E+01	µg/kg	40SS4	17/17	0.4 - 15
Trichloroethene	79-01-6	6.0E-01	2.2E+01	µg/kg	40SS2	16/17	0.4 - 15
Xylenes (Total)	1330-20-7	1.0E+00	8.2E+01	µg/kg	40SS4	16/17	1 - 46

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SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
TCL SVOCs (ug/kg)							
2-Methylnaphthalene	91-57-6	4.5E+01	1.4E+02	µg/kg	40SS5	3/17	24 - 410
Benzaldehyde	100-52-7	6.6E+01	6.6E+01	µg/kg	40SB1A	1/17	39 - 410
Bis(2-ethylhexyl)phthalate	117-81-7	3.8E+01	2.8E+02	µg/kg	40SS3	14/17	32 - 410
Caprolactam	105-60-2	8.0E+02	8.0E+02	µg/kg	40SS2	1/17	62 - 410
Carbazole	86-74-8	4.7E+01	2.0E+02	µg/kg	40SS4	2/17	29 - 410
Di-n-butylphthalate	84-74-2	9.2E+01	1.4E+02	µg/kg	40SB6A	2/17	27 - 570
Di-n-octylphthalate	117-84-0	2.6E+01	5.0E+02	µg/kg	40SS3	5/17	21 - 570
Dibenzofuran	132-64-9	5.2E+01	5.6E+01	µg/kg	40SS5	2/17	24 - 410
TCL PAHs (ug/kg)							
Acenaphthene	83-32-9	2.1E+01	1.2E+03	µg/kg	40SB1A	7/17	5.8 - 52
Acenaphthylene	208-96-8	8.0E+01	2.2E+02	µg/kg	40SS4	2/17	5.9 - 52
Anthracene	120-12-7	1.2E+02	1.2E+02	µg/kg	40SS2	1/17	5.4 - 52
Benzo(a)anthracene	56-55-3	1.1E+01	3.9E+02	µg/kg	40SS4	11/17	2.2 - 10
Benzo(a)pyrene	50-32-8	3.8E+00	3.0E+02	µg/kg	40SS2	12/17	1.6 - 10
Benzo(b)fluoranthene	205-99-2	4.2E+00	5.7E+02	µg/kg	40SS4	15/17	1.7 - 10
Benzo(g,h,i)perylene	191-24-2	1.0E+01	1.4E+02	µg/kg	40SS2	6/17	3.6 - 10
Benzo(k)fluoranthene	207-08-9	1.0E+01	3.7E+02	µg/kg	40SS2	11/17	1.4 - 10
Chrysene	218-01-9	4.5E+00	6.8E+02	µg/kg	40SB1A	13/17	2.4 - 10
Dibenz(a,h)anthracene	53-70-3	1.9E+01	1.1E+02	µg/kg	40SS5	4/17	4.2 - 10
Fluoranthene	206-44-0	2.0E+01	1.5E+03	µg/kg	40SS2	15/17	2.1 - 21
Indeno(1,2,3-cd)pyrene	193-39-5	6.9E+00	2.5E+02	µg/kg	40SS2	10/17	2.5 - 10
Naphthalene	91-20-3	2.6E+01	1.1E+03	µg/kg	40SS4	6/17	14 - 52
Phenanthrene	85-01-8	1.4E+01	5.5E+02	µg/kg	40SS2	8/17	8.5 - 52
Pyrene	129-00-0	1.2E+01	8.1E+02	µg/kg	40SS4	15/17	4.3 - 21
Dioxin/Furans (pg/g)							
2,3,7,8-TCDD TEQ (mammalian)	--	4.1E-01	7.1E+00	pg/g	40SS4	2/2	--
2,3,7,8-TCDD TEQ (avian)	--	4.8E+00	1.7E-01	pg/g	40SS4	2/2	--
DRO/GRO (mg/kg)							
DRO	--	2.1E+01	6.8E+01	mg/kg	71SB14A	2/2	1 - 1

Notes:

CAS = Chemical Abstracts Service
COPEC = Chemical of Potential Ecological Concern
mg/kg = Milligram Per Kilogram
µg/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TEQ = Toxicity Equivalent
DRO = Diesel Range Organics
GRO = Gasoline Range Organics

Table F.2-2
Non-detected Chemicals MDL Screening for SWMU 40 - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
Gasoline Range Organics																		
GRO	--	mg/kg	2	2	0.93	0.95	--	--	NS	--	--	NS	--	--	NS	--	--	NS
TAL Metals																		
Antimony	7440-36-0	mg/kg	3	18	0.17	0.47	5	F	N	78	A	N	--	--	NS	0.27	A	**Y**
Cadmium	7440-43-9	mg/kg	11	19	0.03	0.59	32	A	N	140	A	N	0.77	A	N	0.36	A	**Y**
Copper	7440-50-8	mg/kg	1	19	0.16	0.16	70	A	N	80	A	N	28	A	N	49	A	N
Mercury	7439-97-6	mg/kg	1	19	0.023	0.023	0.3	F	N	0.1	B	N	--	--	NS	--	--	NS
Selenium	7782-49-2	mg/kg	1	19	0.42	0.42	0.52	A	N	4.1	A	N	1.2	A	N	0.63	A	N
Silver	7440-22-4	mg/kg	15	19	0.08	0.13	560	A	N	50	E	N	4.2	A	N	14	A	N
Thallium	7440-28-0	mg/kg	12	14	0.27	0.64	1	F	N	--	--	NS	--	--	NS	--	--	NS
Pesticides/PCBs																		
4,4'-DDD	72-54-8	ug/kg	17	17	0.32	3.9	100	G	N	100	C	N	--	--	NS	--	--	NS
4,4'-DDE	72-55-9	ug/kg	16	17	0.4	2	100	G	N	100	C	N	--	--	NS	--	--	NS
4,4'-DDT	50-29-3	ug/kg	16	17	0.39	5.9	100	G	N	100	C	N	93	A	N	21	A	N
Aldrin	309-00-2	ug/kg	15	17	0.17	0.98	100	G	N	100	C	N	--	--	NS	--	--	NS
alpha-BHC	319-84-6	ug/kg	17	17	0.26	0.98	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
alpha-Chlordane	5103-71-9	ug/kg	14	17	0.22	2	100	G	N	100	C	N	--	--	NS	--	--	NS
beta-BHC	319-85-7	ug/kg	12	17	0.28	2	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
delta-BHC	319-86-8	ug/kg	17	17	0.15	0.98	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
Dieldrin	60-57-1	ug/kg	17	17	0.43	2	100	G	N	100	C	N	22	A	N	4.9	A	N
Endosulfan I	959-98-8	ug/kg	17	17	0.43	2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Endosulfan II	33213-65-9	ug/kg	17	17	0.58	3.9	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Endosulfan Sulfate	1031-07-8	ug/kg	16	17	0.4	3.9	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Endrin	72-20-8	ug/kg	16	17	0.35	3.9	100	G	N	100	C	N	--	--	NS	--	--	NS
Endrin Aldehyde	7421-93-4	ug/kg	17	17	0.35	3.9	100	G	N	100	C	N	--	--	NS	--	--	NS
Endrin Ketone	53494-70-5	ug/kg	16	17	0.39	9.8	100	G	N	100	C	N	--	--	NS	--	--	NS
gamma-BHC (Lindane)	58-89-9	ug/kg	15	17	0.22	0.98	100	G	N	100	C	N	--	--	NS	--	--	NS
gamma-Chlordane	5103-74-2	ug/kg	16	17	0.35	0.98	100	G	N	100	C	N	--	--	NS	--	--	NS
Heptachlor	76-44-8	ug/kg	17	17	0.34	0.98	100	G	N	100	C	N	--	--	NS	--	--	NS
Heptachlor Epoxide	1024-57-3	ug/kg	17	17	0.26	0.98	100	G	N	100	C	N	--	--	NS	--	--	NS
Methoxychlor	72-43-5	ug/kg	16	17	1.4	9.8	100	G	N	100	C	N	--	--	NS	--	--	NS
Toxaphene	8001-35-2	ug/kg	17	17	18	98	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Aroclor 1016	12674-11-2	ug/kg	32	32	5.2	76	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1221	11104-28-2	ug/kg	32	32	14	100	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1232	11141-16-5	ug/kg	32	32	5.4	76	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1242	53469-21-9	ug/kg	32	32	7.6	53	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1248	12672-29-6	ug/kg	31	32	4.5	53	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1254	11097-69-1	ug/kg	4	32	8.5	9	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1260	11096-82-5	ug/kg	21	32	5.4	76	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
TCL VOCs																		
1,1,1-Trichloroethane	71-55-6	ug/kg	17	17	0.5	1	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1,2,2-Tetrachloroethane	79-34-5	ug/kg	17	17	0.2	0.4	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/kg	16	17	6	17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,1,2-Trichloroethane	79-00-5	ug/kg	17	17	0.1	0.4	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1-Dichloroethane	75-34-3	ug/kg	17	17	0.3	0.8	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1-Dichloroethene	75-35-4	ug/kg	17	17	0.6	2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,4-Trichlorobenzene	120-82-1	ug/kg	16	17	0.4	1	100	G	N	100	C	N	--	--	NS	--	--	NS
1,2-Dibromo-3-chloropropane	96-12-8	ug/kg	16	17	0.2	0.7	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2-Dibromoethane	106-93-4	ug/kg	17	17	0.2	0.5	--	--	NS	5,000	C	N	--	--	NS	--	--	NS
1,2-Dichlorobenzene	95-50-1	ug/kg	15	17	0.2	0.4	100	G	N	100	C	N	--	--	NS	--	--	NS
1,2-Dichloroethane	107-06-2	ug/kg	17	17	0.3	0.8	870,000	G	N	--	--	NS	--	--	NS	--	--	NS
1,2-Dichloropropane	78-87-5	ug/kg	17	17	0.2	0.5	300	G	N	300	C	N	--	--	NS	--	--	NS
1,3-Dichlorobenzene	541-73-1	ug/kg	15	17	0.2	0.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,4-Dichlorobenzene	106-46-7	ug/kg	14	17	0.2	0.6	100	G	N	20,000	B	N	--	--	NS	--	--	NS
2-Butanone	78-93-3	ug/kg	9	17	1	3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Hexanone	591-78-6	ug/kg	16	17	0.5	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Table F.2-2
Non-detected Chemicals MDL Screening for SWMU 40 - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
4-Methyl-2-Pentanone	108-10-1	ug/kg	7	17	0.5	0.8	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
Acetone	67-64-1	ug/kg	1	17	1	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Benzene	71-43-2	ug/kg	14	17	0.4	1	100	G	N	100	C	N	--	--	NS	--	--	NS
Bromodichloromethane	75-27-4	ug/kg	17	17	0.2	0.5	450,000	G	N	--	--	NS	--	--	NS	--	--	NS
Bromoform	75-25-2	ug/kg	17	17	0.2	0.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Bromomethane	74-83-9	ug/kg	16	17	0.9	2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Carbon Disulfide	75-15-0	ug/kg	9	17	0.5	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Carbon Tetrachloride	56-23-5	ug/kg	17	17	0.5	1	300	G	N	300	C	N	--	--	NS	--	--	NS
Chlorobenzene	108-90-7	ug/kg	16	17	0.2	0.6	100	G	N	40,000	B	N	--	--	NS	--	--	NS
Chloroethane	75-00-3	ug/kg	17	17	0.4	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Chloroform	67-66-3	ug/kg	17	17	0.4	0.9	300	G	N	300	C	N	--	--	NS	--	--	NS
Chloromethane	74-87-3	ug/kg	15	17	0.9	2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
cis-1,2-Dichloroethene	156-59-2	ug/kg	17	17	0.3	0.9	300	G	N	300	C	N	--	--	NS	--	--	NS
cis-1,3-Dichloropropene	10061-01-5	ug/kg	17	17	0.3	0.8	300	G	N	300	C	N	--	--	NS	--	--	NS
Cyclohexane	110-82-7	ug/kg	15	17	0.4	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dibromochloromethane	124-48-1	ug/kg	17	17	0.2	0.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dichlorodifluoromethane	75-71-8	ug/kg	13	17	0.4	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Ethylbenzene	100-41-4	ug/kg	8	17	0.4	0.9	100	G	N	100	C	N	--	--	NS	--	--	NS
Isopropylbenzene	98-82-8	ug/kg	16	17	6	17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Methyl Acetate	79-20-9	ug/kg	10	17	0.5	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Methyl-t-butyl Ether	1634-04-4	ug/kg	16	17	6	17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Methylcyclohexane	108-87-2	ug/kg	14	17	0.4	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Methylene Chloride	75-09-2	ug/kg	6	17	0.5	1	300	G	N	300	C	N	--	--	NS	--	--	NS
Styrene	100-42-5	ug/kg	12	17	0.2	0.6	300,000	F	N	100	C	N	--	--	NS	--	--	NS
Tetrachloroethene	127-18-4	ug/kg	16	17	0.3	0.9	300	G	N	300	C	N	--	--	NS	--	--	NS
trans-1,2-Dichloroethene	156-60-5	ug/kg	17	17	0.4	0.9	300	G	N	300	C	N	--	--	NS	--	--	NS
trans-1,3-Dichloropropene	10061-02-6	ug/kg	17	17	0.2	0.5	300	G	N	300	C	N	--	--	NS	--	--	NS
Trichloroethene	79-01-6	ug/kg	1	17	0.9	0.9	300	G	N	300	C	N	--	--	NS	--	--	NS
Trichlorofluoromethane	75-69-4	ug/kg	17	17	0.5	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Vinyl Chloride	75-01-4	ug/kg	17	17	0.4	1	300	G	N	300	C	N	--	--	NS	--	--	NS
Xylene (Total)	1330-20-7	ug/kg	1	17	1	1	100	G	N	--	--	NS	--	--	NS	--	--	NS
TCL SVOCs																		
1,1'-Biphenyl	92-52-4	ug/kg	17	17	22	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,2'-oxybis(1-chloropropane)	108-60-1	ug/kg	17	17	30	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,5-Trichlorophenol	95-95-4	ug/kg	17	17	49	390	4,000	F	N	9,000	B	N	--	--	NS	--	--	NS
2,4,6-Trichlorophenol	88-06-2	ug/kg	17	17	50	390	100	G	**Y**	10,000	B	N	--	--	NS	--	--	NS
2,4-Dichlorophenol	120-83-2	ug/kg	17	17	22	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
2,4-Dimethylphenol	105-67-9	ug/kg	17	17	30	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
2,4-Dinitrophenol	51-28-5	ug/kg	17	17	170	2,000	20,000	F	N	100	C	**Y**	--	--	NS	--	--	NS
2,4-Dinitrotoluene	121-14-2	ug/kg	16	17	20	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,6-Dinitrotoluene	606-20-2	ug/kg	16	17	21	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Chloronaphthalene	91-58-7	ug/kg	17	17	22	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Chlorophenol	95-57-8	ug/kg	17	17	18	390	7,000	F	N	10,000	B	N	--	--	NS	--	--	NS
2-Methylnaphthalene	91-57-6	ug/kg	14	17	24	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Methylphenol	95-48-7	ug/kg	17	17	27	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
2-Nitroaniline	88-74-4	ug/kg	17	17	29	780	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Nitrophenol	88-75-5	ug/kg	17	17	26	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3,3'-Dichlorobenzidine	91-94-1	ug/kg	17	17	29	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3-Nitroaniline	99-09-2	ug/kg	17	17	34	780	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4,6-Dinitro-2-Methylphenol	534-52-1	ug/kg	17	17	35	780	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Bromophenyl Phenyl Ether	101-55-3	ug/kg	17	17	390	570	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Chloro-3-Methylphenol	59-50-7	ug/kg	17	17	29	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Chloroaniline	106-47-8	ug/kg	17	17	16	390	20,000	F	N	--	--	NS	--	--	NS	--	--	NS
4-Chlorophenyl Phenyl Ether	7005-72-3	ug/kg	17	17	390	570	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Methylphenol	106-44-5	ug/kg	17	17	48	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
4-Nitroaniline	100-01-6	ug/kg	17	17	39	780	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Table F.2-2
Non-detected Chemicals MDL Screening for SWMU 40 - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
4-Nitrophenol	100-02-7	ug/kg	17	17	75	780	100	G	**Y**	7,000	B	N	--	--	NS	--	--	NS
Acenaphthene	83-32-9	ug/kg	17	17	31	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Acenaphthylene	208-96-8	ug/kg	15	17	17	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Acetophenone	98-86-2	ug/kg	17	17	23	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Anthracene	120-12-7	ug/kg	14	17	25	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Atrazine	1912-24-9	ug/kg	17	17	16	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Benzaldehyde	100-52-7	ug/kg	16	17	39	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Benzo(a)pyrene	50-32-8	ug/kg	11	17	23	390	100	G	**Y**	--	--	NS	--	--	NS	--	--	NS
Benzo(a)anthracene	56-55-3	ug/kg	12	17	29	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Benzo(b)fluoranthene	205-99-2	ug/kg	11	17	36	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Benzo(g,h,i)perylene	191-24-2	ug/kg	12	17	23	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Benzo(k)fluoranthene	207-08-9	ug/kg	11	17	29	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
bis(2-Chloroethoxy)methane	111-91-1	ug/kg	17	17	21	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
bis(2-Chloroethyl)ether	111-44-4	ug/kg	17	17	18	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
bis(2-ethylhexyl)phthalate	117-81-7	ug/kg	3	17	32	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Butylbenzylphthalate	85-68-7	ug/kg	17	17	390	570	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Caprolactam	105-60-2	ug/kg	16	17	62	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Carbazole	86-74-8	ug/kg	15	17	29	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Chrysene	218-01-9	ug/kg	10	17	28	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Di-n-butylphthalate	84-74-2	ug/kg	15	17	390	570	200,000	F	N	--	--	NS	--	--	NS	--	--	NS
Di-n-octylphthalate	117-84-0	ug/kg	12	17	390	570	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dibenzo(a,h)anthracene	53-70-3	ug/kg	14	17	21	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Dibenzofuran	132-64-9	ug/kg	15	17	24	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Diethylphthalate	84-66-2	ug/kg	17	17	390	570	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dimethylphthalate	131-11-3	ug/kg	17	17	390	570	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Fluoranthene	206-44-0	ug/kg	9	17	18	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Fluorene	86-73-7	ug/kg	16	17	18	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Hexachlorobenzene	118-74-1	ug/kg	17	17	22	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Hexachlorobutadiene	87-68-3	ug/kg	17	17	24	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Hexachlorocyclopentadiene	77-47-4	ug/kg	17	17	67	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Hexachloroethane	67-72-1	ug/kg	17	17	17	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	11	17	20	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Isophorone	78-59-1	ug/kg	17	17	28	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
n-Nitroso-di-n-Propylamine	621-64-7	ug/kg	17	17	21	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
n-Nitrosodiphenylamine	86-30-6	ug/kg	17	17	390	1,100	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Naphthalene	91-20-3	ug/kg	15	17	21	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Nitrobenzene	98-95-3	ug/kg	17	17	28	390	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Pentachlorophenol	87-86-5	ug/kg	17	17	46	390	5,000	A	N	31,000	A	N	2,100	A	N	2,800	A	N
Phenol	108-95-2	ug/kg	17	17	34	390	100	G	**Y**	30,000	B	N	--	--	NS	--	--	NS
Phenanthrene	85-01-8	ug/kg	11	17	24	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Pyrene	129-00-0	ug/kg	10	17	24	390	100	G	**Y**	100	C	**Y**	--	--	NS	--	--	NS
Dioxin/Furans (pg/g)																		
1,2,3,4,7,8,9-HpCDF	55673-89-7	pg/g	1	2	0.6	0.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,4,7,8-HxCDD	39227-28-6	pg/g	1	2	0.5	0.5	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,4,7,8-HxCDF	70648-26-9	pg/g	1	2	0.3	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,6,7,8-HxCDD	57653-85-7	pg/g	1	2	0.6	0.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,6,7,8-HxCDF	57117-44-9	pg/g	1	2	0.3	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8,9-HxCDD	19408-74-3	pg/g	1	2	0.5	0.5	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8,9-HxCDF	72918-21-9	pg/g	2	2	0.4	0.5	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8-PeCDD	40321-76-4	pg/g	1	2	0.4	0.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,4,6,7,8-HxCDF	60851-34-5	pg/g	1	2	0.4	0.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,4,7,8-PeCDF	57117-31-4	pg/g	1	2	0.3	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,7,8-TCDD	1746-01-6	pg/g	2	2	0.3	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,7,8-TCDF	51207-31-9	pg/g	2	2	0.3	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total PeCDD	36088-22-9	pg/g	1	2	0.4	0.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total TCDD	41903-57-5	pg/g	2	2	0.3	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total TCDF	55722-27-5	pg/g	1	2	0.3	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Table F.2-2
Non-detected Chemicals MDL Screening for SWMU 40 - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
PAHs																		
Acenaphthene	83-32-9	ug/kg	10	17	5.8	5.9	100	G	N	100	C	N	--	--	NS	--	--	NS
Acenaphthylene	208-96-8	ug/kg	15	17	5.9	5.9	100	G	N	100	C	N	--	--	NS	--	--	NS
Anthracene	120-12-7	ug/kg	16	17	5.4	5.4	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(a)pyrene	50-32-8	ug/kg	5	17	1.6	1.6	100	G	N	--	--	NS	--	--	NS	--	--	NS
Benzo(a)anthracene	56-55-3	ug/kg	6	17	2.2	2.2	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(b)fluoranthene	205-99-2	ug/kg	2	17	1.7	1.7	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(k)fluoranthene	207-08-9	ug/kg	6	17	1.4	1.4	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(g,h,i)perylene	191-24-2	ug/kg	11	17	3.6	3.6	100	G	N	100	C	N	--	--	NS	--	--	NS
Chrysene	218-01-9	ug/kg	4	17	2.4	2.4	100	G	N	100	C	N	--	--	NS	--	--	NS
Dibenzo(a,h)anthracene	53-70-3	ug/kg	13	17	4.2	4.2	100	G	N	100	C	N	--	--	NS	--	--	NS
Fluoranthene	206-44-0	ug/kg	2	17	2.1	2.1	100	G	N	100	C	N	--	--	NS	--	--	NS
Fluorene	86-73-7	ug/kg	17	17	14	14	100	G	N	100	C	N	--	--	NS	--	--	NS
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	7	17	2.5	2.5	100	G	N	100	C	N	--	--	NS	--	--	NS
Naphthalene	91-20-3	ug/kg	11	17	14	14	100	G	N	100	C	N	--	--	NS	--	--	NS
Phenanthrene	85-01-8	ug/kg	9	17	8.5	8.5	100	G	N	100	C	N	--	--	NS	--	--	NS
Pyrene	129-00-0	ug/kg	2	17	4.3	4.3	100	G	N	100	C	N	--	--	NS	--	--	NS
Explosives																		
1,3,5-Trinitrobenzene	99-35-4	mg/kg	17	17	0.079	0.079	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,3-Dinitrobenzene	99-65-0	mg/kg	17	17	0.097	0.097	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,6-Trinitrotoluene	118-96-7	mg/kg	17	17	0.16	0.16	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4-Dinitrotoluene	121-14-2	mg/kg	17	17	0.12	0.12	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,6-Dinitrotoluene	606-20-2	mg/kg	17	17	0.19	0.19	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Amino-4,6-Dinitrotoluene	35572-78-2	mg/kg	17	17	0.1	0.1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Nitrotoluene	88-72-2	mg/kg	17	17	0.16	0.16	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3-Nitrotoluene	99-08-1	mg/kg	17	17	0.11	0.11	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Amino-2,6-Dinitrotoluene	1946-51-0	mg/kg	17	17	0.095	0.095	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Nitrotoluene	99-99-0	mg/kg	17	17	0.27	0.27	--	--	NS	--	--	NS	--	--	NS	--	--	NS
HMX	2691-41-0	mg/kg	17	17	0.1	0.1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Nitrobenzene	98-95-3	mg/kg	17	17	0.17	0.17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
RDX	121-82-4	mg/kg	17	17	0.28	0.28	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Tetryl	479-45-8	mg/kg	17	17	0.4	0.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Nitroglycerin																		
Nitroglycerin	55-63-0	mg/kg	17	17	1	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
SL = Screening Level
Eco SSL = Ecological Soil Screening Level

Sources:
A = USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
B = ORNL - Earthworms - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
C = BTAG - Fauna - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
E = ORNL - Microbial Processes - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
F = ORNL - Plants - Toxilogical Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision Efroymson et al.)
G = BTAG - Flora - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available

Table F.2-3a
Dioxin/Furan Equivalent Calculation - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	CAS #	Mammalian TEF	Avian TEF	40SS4 11/11/2002 0-1		40SS5 11/11/2002 0-1	
				Result	LQ, VQ, r	Result	LQ, VQ, r
Dioxin/Furans (pg/g)							
1,2,3,4,6,7,8,9-OCDD (OCDD)	3268-87-9	0.0003	0.0001	1,640		248	
1,2,3,4,6,7,8,9-OCDF (OCDD)	39001-02-0	0.0003	0.0001	151		13.6	
1,2,3,4,6,7,8-HpCDD	35822-39-4	0.01	0.001	218		26.6	
1,2,3,4,6,7,8-HpCDF	67562-39-4	0.01	0.01	48.2		4	J
1,2,3,4,7,8,9-HpCDF	55673-89-7	0.01	0.01	4.6	J	<5	
1,2,3,4,7,8-HxCDD	39227-28-6	0.1	0.05	2.1	MJ	<5	
1,2,3,4,7,8-HxCDF	70648-26-9	0.1	0.1	2.4	MJ	<5	
1,2,3,6,7,8-HxCDD	57653-85-7	0.1	0.01	6.3		<5	
1,2,3,6,7,8-HxCDF	57117-44-9	0.1	0.1	2	J	<5	
1,2,3,7,8,9-HxCDD	19408-74-3	0.1	0.1	5.5		<5	
1,2,3,7,8,9-HxCDF	72918-21-9	0.1	0.1	<5		<5	
1,2,3,7,8-PeCDD	40321-76-4	1	1	1.3	MJ	<5	
1,2,3,7,8-PeCDF	57117-41-6	0.03	0.1	11.5	MX,J,w	0.79	MXJ,J,w
2,3,4,6,7,8-HxCDF	60851-34-5	0.1	0.1	3.1	J	<5	
2,3,4,7,8-PeCDF	57117-31-4	0.3	1	0.37	J	<5	
2,3,7,8-TCDD	1746-01-6	1	1	<1		<1	
2,3,7,8-TCDF	51207-31-9	0.1	1	<1		<1	
Total 2,3,7,8-TCDD Equivalents (Mammalian)				7.141		0.408	
Total 2,3,7,8-TCDD Equivalents (Avian)				4.843		0.172	

Notes:

pg/g = Picogram Per Gram
ft bgs = Feet Below Ground Surface
TEF = Toxicity Equivalency Factor
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code

Total 2,3,7,8-TCDD Equivalents are calculated by summing the detected concentration times the TEF for each chemical. Non-detects, R-flagged data, and B-flagged data are excluded from summed total.

Qualifiers:

J	Analyte present. Reported value may not be accurate or precise.
U	The compound was analyzed for but not detected. The reporting limit will be adjusted to reflect any dilution, and for soil, the percent moisture.
X	Associated PCDF peak(s) has the same retention time as the associated diphenyl ether and the diphenyl ether contribution is greater than 10%.
w	Retention time failure.

Table F.2-3b
Summary of Low and High Molecular Weight PAHs - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID		40SB1A		40SB2A		40SB3A		40SB4A		40SB5A		40SB6A		40SB7A		40SB8A		40SB9A	
Sample Date		11/15/2002		11/15/2002		11/14/2002		11/14/2002		11/14/2002		11/13/2002		11/13/2002		11/13/2002		11/13/2002	
Sample Depth (ft bgs)		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1	
	CAS #	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
TCL PAHs (ug/kg)																			
Acenaphthene	83-32-9	1,200	P,J,g	<51	U	47	J,J,c	<49	U	<51	U	21	J,J,c	<49	U	<52	U	<51	U
Acenaphthylene	208-96-8	<51	U	<51	U	<54	U	<49	U	<51	U	<51	U	<49	U	<52	U	<51	U
Anthracene	120-12-7	<51	U	<51	U	<54	U	<49	U	<51	U	<51	U	<49	U	<52	U	<51	U
Fluorene	86-73-7	<51	U	<51	U	<54	U	<49	U	<51	U	<51	U	<49	U	<52	U	<51	U
Naphthalene	91-20-3	<51	U	<51	U	<54	U	<49	U	<51	U	33	J,J,d	<49	U	78	P,J,g	<51	U
Phenanthrene	85-01-8	<51	U	<51	U	22	J	<49	U	<51	U	<51	U	55		14	J	<51	U
Low Molecular Weight PAHs	--	1,200		ND		69		ND		ND		54		55		92		ND	
Benzo(a)anthracene	56-55-3	14	J	<10	U	29		<9.8	U	<10	U	<10	U	27		28		30	P,J,g
Benzo(a)pyrene	50-32-8	35	J	<10	U	41	P,J,g	<9.8	U	3.8	J	<10	U	31		14		<10	U
Benzo(b)fluoranthene	205-99-2	32	JP,J,g	<10	U	63	BP,J,g	19	JPZ,J,g	4.2	J	5.4	JP,J,g	42	P,J,g	31	J,c	160	J,c
Benzo(g,h,i)perylene	191-24-2	<10	U	<10	U	24	P,J,g	<9.8	U	<10	U	<10	U	51	P,J,g	<10	U	<10	U
Benzo(k)fluoranthene	207-08-9	<10	U	<10	U	53	P,J,g	<9.8	U	<10	U	10	JP,J,d	53	P,J,d	29	P,J,g	<10	U
Chrysene	218-01-9	680	P,J,g	<10	U	<11	U	<9.8	U	4.5	J	5.2	J	210	EP,J,g	140	P,J,g	57	P,J,g
Dibenz(a,h)anthracene	53-70-3	<10	U	<10	U	44		<9.8	U	<10	U	<10	U	19	P,J,g	<10	U	<10	U
Fluoranthene	206-44-0	170	P,J,g	20	JP,J,g	67		<20	U	<20	U	26	P,J,g	130	P,J,g	84		46	
Indeno(1,2,3-cd)pyrene	193-39-5	<10	U	<10	U	48		<9.8	U	<10	U	6.9	J	14	P,J,g	180	P,J,g	150	P,J,g
Pyrene	129-00-0	87	JP,J,g	20	JP,J,g	35	B,B,z	67	JPZ,J,g	<20	U	17	JP,J,g	68		67	P,J,c	<21	U
High Molecular Weight PAHs	--	1,018		40		404		86		13		71		645		573		443	

Table F.2-3b
Summary of Low and High Molecular Weight PAHs - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID		40SB10A		40SB12A		40SB13A		40SS1		40SS2		40SS3		40SS4		40SS5	
Sample Date		11/13/2002		11/11/2002		11/19/2002		11/11/2002		11/11/2002		11/11/2002		11/11/2002		11/11/2002	
Sample Depth (ft bgs)		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1	
	CAS #	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
TCL PAHs (ug/kg)																	
Acenaphthene	83-32-9	<49	U,UL,s	<49	U	<49	U	<53	U	560	PZ,K,s	190	P,J,g	640	PZ,K,s	250	P,J,g
Acenaphthylene	208-96-8	<49	U,UL,s	<49	U	<49	U	<53	U	<52	U	<53	U	220	JPZ,J,c	80	P,J,g
Anthracene	120-12-7	<49	U,UL,s	<49	U	<49	U	<53	U	120	JPZ,K,s	<53	U	<72	U	<61	U
Fluorene	86-73-7	<49	U,UL,s	<49	U	<49	U	<53	U	<52	U	<53	U	<72	U	<61	U
Naphthalene	91-20-3	26	J,J,d	<49	U	<49	U	<53	U	250	JZ,K,s	160		1,100	P,K,s	<61	U
Phenanthrene	85-01-8	24	J,L,s	<49	U	<49	U	<53	U	550	J,c	120		360	J,c	100	
Low Molecular Weight PAHs	--	50		ND		ND		ND		1,480		470		2,320		430	
Benzo(a)anthracene	56-55-3	11	L,s	<9.8	U	<9.8	U	40	P,K,s	120	PZ,K,s	83	P,J,g	390	Z,K,s	67	P,J,g
Benzo(a)pyrene	50-32-8	19	P,L,s	<9.8	U	22	P,J,g	16	K,s	300	Z,K,s	62	P,J,g	120	Z,K,s	38	P,J,g
Benzo(b)fluoranthene	205-99-2	18	J,c	<9.8	U	25	JZ	110	P,K,s	380	E,K,s	100		570	EP,K,s	130	
Benzo(g,h,i)perylene	191-24-2	10	JP,L,s	<9.8	U	<9.8	U	<10	U	140	K,s	110	P,J,g	<14	U	37	P,J,g
Benzo(k)fluoranthene	207-08-9	18	L,s	110	P,J,g	<9.8	U	26	P,K,s	370	EP,K,s	100	P,J,g	340	EP,K,s	120	P,J,g
Chrysene	218-01-9	94	P,L,s	<9.8	U	310	PZ,J,g	17	P,K,s	350	Z,K,s	83	P,J,g	400	Z,K,s	89	P,J,g
Dibenz(a,h)anthracene	53-70-3	<9.8	U,UL,s	<9.8	U	<9.8	U	<10	U	<10	U	25	P,J,g	<14	U	110	P,J,g
Fluoranthene	206-44-0	58	L,s	39	P,J,g	64	P,J,g	99	P,K,s	1,500	E,J,c	530	EP,J,g	1,500	E,J,c	340	P,J,g
Indeno(1,2,3-cd)pyrene	193-39-5	11	L,s	<9.8	U	<9.8	U	110	P,K,s	250	E,K,s	<10	U	130	PZ,K,s	72	P,J,g
Pyrene	129-00-0	41	P,J,c	12	JP,J,g	85	JPZ,J,g	43	P,K,s	730	Z,K,s	230		810	PZ,K,s	120	P,J,g
High Molecular Weight PAHs	--	280		161		506		461		4,140		1,323		4,260		1,123	

Notes:
CAS = Chemical Abstract Service
ug/kg = Microgram per kilogram
ND = Not Detected
TAL = Target Analyte List
PAH = Polynuclear Aromatic Hydrocarbon
See Table 4-1 for flag definitions

Table F.2-3c
Summary of Total PCBs - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID		40SB1A		40SB2A		40SB3A		40SB4A		40SB5A		40SB6A		40SB7A		40SB8A		40SB9A		40SB10A		40SB12A	
Sample Date		11/15/2002		11/15/2002		11/14/2002		11/14/2002		11/14/2002		11/13/2002		11/13/2002		11/13/2002		11/13/2002		11/13/2002		11/11/2002	
Sample Depth (ft bgs)		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1	
	CAS #	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
PCBs (ug/kg)																							
Aroclor 1016	12674-11-2	<79	U	<79	U	<83	U	<38	U	<78	U	<79	U	<76	U	<80	U	<79	U	<76	U	<76	U
Aroclor 1232	11141-16-5	<79	U	<79	U	<83	U	<38	U	<78	U	<79	U	<76	U	<80	U	<79	U	<76	U	<76	U
Aroclor 1242	53469-21-9	<55	U	<55	U	<58	U	<26	U	<54	U	<55	U	<53	U	<56	U	<55	U	<53	U	<53	U
Aroclor 1248	12672-29-6	<55	U	<55	U	<58	U	<26	U	<54	U	<55	U	<53	U	<56	U	<55	U	<53	U	<53	U
Aroclor 1254	11097-69-1	230		22	J	<58	U	<26	U	75		20	J	90	P,J,g	39	J	29	J	130		220	
Aroclor 1260	11096-82-5	130		<79	U	<83	U	<38	U	21	J	18	J	<76	U	<80	U	<79	U	45	J	<76	U
Total PCBs	--	360		22		ND		ND		96		38		90		39		29		175		220	

Table F.2-3c
Summary of Total PCBs - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID		40SB13A		40SS1		40SS2		40SS3		40SS4		40SS5		40SS6		40SS7		40SS8		40SS9 DUP AVG		40SS10	
Sample Date		11/19/2002		11/11/2002		11/11/2002		11/11/2002		11/11/2002		11/11/2002		4/21/2006		4/21/2006		4/21/2006		4/21/2006		4/21/2006	
Sample Depth (ft bgs)		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1	
	CAS #	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
PCBs (ug/kg)																							
Aroclor 1016	12674-11-2	<76	U	<410	U	<80	U	<82	U	<110	U	<94	U	<93	U	<99	U	<100	U	<97	U	<94	U
Aroclor 1232	11141-16-5	<76	U	<410	U	<80	U	<82	U	<110	U	<94	U	<93	U	<99	U	<100	U	<97	U	<94	U
Aroclor 1242	53469-21-9	<53	U	<280	U	<56	U	<57	U	<78	U	<65	U	<46	U	<49	U	<50	U	<49	U	<47	U
Aroclor 1248	12672-29-6	<53	U	<280	U	<56	U	<57	U	<78	U	<65	U	<46	U	<49	U	<50	U	<49	U	<47	U
Aroclor 1254	11097-69-1	59		2,100		120		270		<78	U	48	J	<46	U	800		210		40	J,J,g	32	J
Aroclor 1260	11096-82-5	<76	U	<410	U	<80	U,UJ,c	<82	U	<110	U	<94	U	<93	U	620		200		12.55	J	<94	U
Total PCBs	--	59		2100		120		270		ND		48		ND		1420		410		52.55		32	

Table F.2-3c
Summary of Total PCBs - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID		40SS11 DUP AVG		40SS12		40SS13		40SS14		40SS15		40SS16		40SS17		40SS18		71SB14A		71SB15A DUP AVG	
Sample Date		4/21/2006		4/21/2006		4/21/2006		4/21/2006		4/21/2006		4/21/2006		4/21/2006		4/21/2006		4/20/2006		4/21/2006	
Sample Depth (ft bgs)		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1		0-1	
	CAS #	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
PCBs (ug/kg)																					
Aroclor 1016	12674-11-2	<100	U	<110	U	<100	U	<99	U	<100	U	<100	U	<99	U	<96	U	<80	U	<310	U
Aroclor 1232	11141-16-5	<100	U	<110	U	<100	U	<99	U	<100	U	<100	U	<99	U	<96	U	<80	U	<310	U
Aroclor 1242	53469-21-9	<51	U	<54	U	<50	U	<49	U	<52	U	<51	U	<49	U	<48	U	<40	U	<160	U
Aroclor 1248	12672-29-6	<51	U	<54	U	<50	U	<49	U	<52	U	<51	U	<49	U	<48	U	<40	U	189.5	J
Aroclor 1254	11097-69-1	153.5		38	J	58		55	J,g	130		440		160		28	J	310		105.45	J,f
Aroclor 1260	11096-82-5	<100	U	<100	U	<100	U	33	J	72	J	230		150		<96	U	<80	U	<310	U
Total PCBs	--	153.5		38		58		88		202		670		310		28		310		294.95	

Notes:
CAS = Chemical Abstract Service
ug/kg = Microgram per kilogram
ND = Not Detected
PBC = PolyChlorinated Biphenyl
See Table 4-1 for flag definitions

Table F.2-4
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Exposure to Contaminants in SWMU 40 Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Surface Soil	Aluminum	mg/kg	14,470	16,945	28,500	16,945	mg/kg	95% Student's t UCL	ProUCL 4.0
	Arsenic	mg/kg	9.944	25.61	55	25.61	mg/kg	95% Chebyshev (Mean,Sd) UCL	ProUCL 4.0
	Cadmium	mg/kg	0.261	0.230	0.75	0.230	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Calcium	mg/kg	6,453	9,550	26,300	9,550	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Chromium	mg/kg	22.86	25.95	37.6	25.95	mg/kg	95% Student's t UCL	ProUCL 4.0
	Cobalt	mg/kg	6.771	7.819	13.2	7.819	mg/kg	95% Student's t UCL	ProUCL 4.0
	Copper	mg/kg	19.99	39.1	76	39.1	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Iron	mg/kg	22,272	30,115	32,000	30,115	mg/kg	95% Chebyshev (Mean,Sd) UCL	ProUCL 4.0
	Lead	mg/kg	27.45	53.99	110	53.99	mg/kg	95% Chebyshev (Mean,Sd) UCL	ProUCL 4.0
	Manganese	mg/kg	333.9	416.2	894	416.2	mg/kg	95% Student's t UCL	ProUCL 4.0
	Mercury	mg/kg	0.254	0.933	2.1	0.933	mg/kg	97.5% KM (Chebyshev) UCL	ProUCL 4.0
	Selenium	mg/kg	1.381	1.657	3.3	1.657	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Vanadium	mg/kg	39.97	55.35	56.9	55.35	mg/kg	95% Chebyshev (Mean,Sd) UCL	ProUCL 4.0
	Zinc	mg/kg	59.84	75.97	148	75.97	mg/kg	95% Student's t UCL	ProUCL 4.0
	4,4-DDT*	mg/kg	--	--	0.0077	0.0077	mg/kg	--	--
	Aroclor 1254	mg/kg	0.216	0.523	2.1	0.523	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Aroclor 1260	mg/kg	0.0874	0.0546	0.23	0.0546	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Acenaphthene	mg/kg	0.415	0.328	1.2	0.328	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Phenanthrene	mg/kg	0.156	0.146	0.55	0.146	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,3,7,8-TCDD TEQ**	mg/kg	--	--	7.00E-06	7.00E-06	mg/kg	--	--

Notes:
FOD = frequency of detection
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram
* Due to the low frequency of detection, a mean and UCL were not calculated.
** Due to the sample size (2 samples), a mean and UCL were not calculated.

Table F.2-5
Plant Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TAL Metals			
Aluminum	7429-90-5	50	ORNL-Plants
Antimony	7440-36-0	5	ORNL-Plants
Arsenic	7440-38-2	18	ECO SSL
Barium	7440-39-3	500	ORNL-Plants
Beryllium	7440-41-7	10	ORNL-Plants
Cadmium	7440-43-9	32	ECO SSL
Calcium	7440-70-2	4	ORNL-Plants
Chromium	7440-47-3	1	ORNL-Plants
Cobalt	7440-48-4	13	ECO SSL
Copper	7440-50-8	70	ECO SSL
Iron	7439-89-6	NV	--
Lead	7439-92-1	120	ECO SSL
Magnesium	7439-95-4	NV	--
Manganese	7439-96-5	220	ECO SSL
Mercury	7439-97-6	0.3	ORNL-Plants
Nickel	7440-02-0	38	ECO SSL
Potassium	7440-09-7	NV	--
Selenium	7782-49-2	0.52	ECO SSL
Silver	7440-22-4	560	ECO SSL
Sodium	7440-23-5	NV	--
Vanadium	7440-62-2	2	ORNL-Plants
Zinc	7440-66-6	160	ECO SSL
Pesticides/PCBs			
4,4'-DDE	72-55-9	0.1	BTAG - Flora
4,4'-DDT	50-29-3	0.1	BTAG - Flora
Aldrin	309-00-2	0.1	BTAG - Flora
alpha-Chlordane [1]	5103-71-9	0.1	BTAG - Flora
beta-BHC	319-85-7	100	BTAG - Flora
Endosulfan Sulfate	1031-07-8	NV	--
Endrin	72-20-8	0.1	BTAG - Flora
Endrin Ketone	53494-70-5	0.1	BTAG - Flora
gamma-BHC (Lindane)	58-89-9	0.1	BTAG - Flora
gamma-Chlordane [1]	5103-74-2	0.1	BTAG - Flora
Methoxychlor	72-43-5	0.1	BTAG - Flora
Aroclor 1254	11097-69-1	NV	--
Aroclor 1260	11096-82-5	NV	--
PCBs (Total)	--	40	ORNL-Plants
TCL VOCs			
1,2,4-Trichlorobenzene	120-82-1	0.1	BTAG - Flora
1,2-Dibromo-3-Chloropropane	96-12-8	NV	--
1,2-Dichlorobenzene	95-50-1	0.1	BTAG - Flora
1,3-Dichlorobenzene	541-73-1	NV	--
1,4-Dichlorobenzene	106-46-7	0.1	BTAG - Flora
2-Butanone	78-93-3	NV	--
2-Hexanone	591-78-6	NV	--
4-Methyl-2-Pentanone	108-10-1	100	BTAG - Flora
Acetone	67-64-1	NV	--
Benzene	71-43-2	0.1	BTAG - Flora
Bromomethane	74-83-9	NV	--
Carbon Disulfide	75-15-0	NV	--
Chlorobenzene	108-90-7	0.1	BTAG - Flora
Chloromethane	74-87-3	NV	--
Cyclohexane	110-82-7	NV	--
Dichlorodifluoromethane	75-71-8	NV	--
Ethylbenzene	100-41-4	0.1	BTAG - Flora
Isopropylbenzene	98-82-8	NV	--
Methyl Acetate	79-20-9	NV	--
Methyl Tert-Butyl Ether	1634-04-4	NV	--
Methylcyclohexane	108-87-2	NV	--
Methylene Chloride	75-09-2	0.3	BTAG - Flora

Table F.2-5
Plant Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
Styrene	100-42-5	300	ORNL-Plants
Tetrachloroethene	127-18-4	0.3	BTAG - Flora
Toluene	108-88-3	200	ORNL-Plants
Trichloroethene	79-01-6	0.3	BTAG - Flora
Xylenes (Total)	1330-20-7	0.1	BTAG - Flora
TCL SVOCs			
2,4-Dinitrotoluene	121-14-2	NV	--
2,6-Dinitrotoluene	606-20-2	NV	--
2-Methylnaphthalene	91-57-6	NV	--
Benzaldehyde	100-52-7	NV	--
Bis(2-ethylhexyl)phthalate	117-81-7	NV	--
Caprolactam	105-60-2	NV	--
Carbazole	86-74-8	NV	--
Di-n-butylphthalate	84-74-2	200	ORNL-Plants
Di-n-octylphthalate	117-84-0	NV	--
Dibenzofuran	132-64-9	NV	--
TCL PAHs			
Low Molecular Weight PAHs	--	NV	--
High Molecular Weight PAHs	--	NV	--

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
NV = No Value Available
TAL = Target Analyte List
TCL = Target Compound List
USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
ORNL - Plants - Toxilogical Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision Efroymson et al.)
BTAG - Flora - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
[1] = Chlordane BTAG Screening Level Used
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
See Table F.3-3b for Total Low and High Molecular Weight PAHs
See Table F.3-3c for Total PCBs

Table F.2-6
Plant Screening - Soil
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Inorganics						
Aluminum	7429-90-5	28,500	50	**5.7E+02**	16,945	**3.4E+02**
Antimony	7440-36-0	1.3	5	2.6E-01	NC	NC
Arsenic	7440-38-2	55	18	**3.1E+00**	25.61	**1.4E+00**
Barium	7440-39-3	191	500	3.8E-01	NC	NC
Beryllium	7440-41-7	1.5	10	1.5E-01	NC	NC
Cadmium	7440-43-9	0.75	32	2.3E-02	NC	NC
Calcium	7440-70-2	26,300	4	**6.6E+03**	9,550	**2.4E+03**
Chromium	7440-47-3	37.6	1	**3.8E+01**	25.95	**2.6E+01**
Cobalt	7440-48-4	13.2	13	**1.0E+00**	7.819	6.0E-01
Copper	7440-50-8	76	70	**1.1E+00**	39.1	5.6E-01
Iron	7439-89-6	32,000	NV	NC	NC	NC
Lead	7439-92-1	110	120	9.2E-01	NC	NC
Magnesium	7439-95-4	24,400	NV	NC	NC	NC
Manganese	7439-96-5	894	220	**4.1E+00**	416.2	**1.9E+00**
Mercury	7439-97-6	2.1	0.3	**7.0E+00**	0.933	**3.1E+00**
Nickel	7440-02-0	20.9	38	5.5E-01	NC	NC
Potassium	7440-09-7	5,240	NV	NC	NC	NC
Selenium	7782-49-2	3	0.52	**6.3E+00**	1.657	**3.2E+00**
Silver	7440-22-4	0.2	560	3.6E-04	NC	NC
Sodium	7440-23-5	370	NV	NC	NC	NC
Vanadium	7440-62-2	56.9	2	**2.8E+01**	55.35	**2.8E+01**
Zinc	7440-66-6	148	160	9.3E-01	NC	NC
Pesticides/PCBs						
4,4'-DDE	72-55-9	0.0018	0.1	1.8E-02	NC	NC
4,4'-DDT	50-29-3	0.0077	0.1	7.7E-02	NC	NC
Aldrin	309-00-2	0.0051	0.1	5.1E-02	NC	NC
alpha-Chlordane	5103-71-9	0.0032	0.1	3.2E-02	NC	NC
beta-BHC	319-85-7	0.012	100	1.2E-04	NC	NC
Endosulfan Sulfate	1031-07-8	0.029	NV	NC	NC	NC
Endrin	72-20-8	0.0039	0.1	3.9E-02	NC	NC
Endrin Ketone	53494-70-5	0.024	0.1	2.4E-01	NC	NC
gamma-BHC (Lindane)	58-89-9	0.011	0.1	1.1E-01	NC	NC
gamma-Chlordane	5103-74-2	0.0076	0.1	7.6E-02	NC	NC
Methoxychlor	72-43-5	0.043	0.1	4.3E-01	NC	NC
PCBs (Total)	--	2.1	40	5.3E-02	NC	NC
TCL VOCs						
1,2,4-Trichlorobenzene	120-82-1	0.0007	0.1	7.0E-03	NC	NC
1,2-Dibromo-3-Chloropropane	96-12-8	0.0004	NV	NC	NC	NC
1,2-Dichlorobenzene	95-50-1	0.0008	0.1	8.0E-03	NC	NC
1,3-Dichlorobenzene	541-73-1	0.0009	NV	NC	NC	NC
1,4-Dichlorobenzene	106-46-7	0.001	0.1	1.0E-02	NC	NC
2-Butanone	78-93-3	0.04	NV	NC	NC	NC
2-Hexanone	591-78-6	0.002	NV	NC	NC	NC
4-Methyl-2-Pentanone	108-10-1	0.031	100	3.1E-04	NC	NC
Acetone	67-64-1	0.46	NV	NC	NC	NC
Benzene	71-43-2	0.006	0.1	6.0E-02	NC	NC
Bromomethane	74-83-9	0.003	NV	NC	NC	NC
Carbon Disulfide	75-15-0	0.004	NV	NC	NC	NC
Chlorobenzene	108-90-7	0.0004	0.1	4.0E-03	NC	NC
Chloromethane	74-87-3	0.003	NV	NC	NC	NC
Cyclohexane	110-82-7	0.003	NV	NC	NC	NC
Dichlorodifluoromethane	75-71-8	0.003	NV	NC	NC	NC
Ethylbenzene	100-41-4	0.017	0.1	1.7E-01	NC	NC
Isopropylbenzene	98-82-8	0.003	NV	NC	NC	NC
Methyl Acetate	79-20-9	0.12	NV	NC	NC	NC
Methyl Tert-Butyl Ether	1634-04-4	0.002	NV	NC	NC	NC
Methylcyclohexane	108-87-2	0.027	NV	NC	NC	NC
Methylene Chloride	75-09-2	0.014	0.3	4.7E-02	NC	NC
Styrene	100-42-5	0.002	300	6.7E-06	NC	NC
Tetrachloroethene	127-18-4	0.001	0.3	3.3E-03	NC	NC
Toluene	108-88-3	0.019	200	9.5E-05	NC	NC
Trichloroethene	79-01-6	0.022	0.3	7.3E-02	NC	NC
Xylenes (Total)	1330-20-7	0.082	0.1	8.2E-01	NC	NC

Table F.2-6
Plant Screening - Soil
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
TCL SVOCs						
2,4-Dinitrotoluene	121-14-2	0.035	NV	NC	NC	NC
2,6-Dinitrotoluene	606-20-2	0.04	NV	NC	NC	NC
2-Methylnaphthalene	91-57-6	0.14	NV	NC	NC	NC
Benzaldehyde	100-52-7	0.066	NV	NC	NC	NC
Bis(2-ethylhexyl)phthalate	117-81-7	0.28	NV	NC	NC	NC
Caprolactam	105-60-2	0.8	NV	NC	NC	NC
Carbazole	86-74-8	0.2	NV	NC	NC	NC
Di-n-butylphthalate	84-74-2	0.14	200	7.0E-04	NC	NC
Di-n-octylphthalate	117-84-0	0.5	NV	NC	NC	NC
Dibenzofuran	132-64-9	0.056	NV	NC	NC	NC
TCL PAHs						
Low Molecular Weight PAHs	--	2.32	NV	NC	NC	NC
High Molecular Weight PAHs	--	4.26	NV	NC	NC	NC

Notes:

CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
NV = No Value Available
NC = Not Calculated
Hazard Quotient = Soil Concentration/Screening Level
EPC = Exposure Point Concentration
See Table F.2-3b for Total Low and High Molecular Weight PAHs
See Table F.2-3c for Total PCBs

Table F.2-7
Invertebrate and Microbial Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TAL Metals			
Aluminum	7429-90-5	NV	--
Antimony	7440-36-0	78	ECO SSL
Arsenic	7440-38-2	60	ORNL-Earthworm
Barium	7440-39-3	330	ECO SSL
Beryllium	7440-41-7	40	ECO SSL
Cadmium	7440-43-9	140	ECO SSL
Calcium	7440-70-2	NV	--
Chromium	7440-47-3	0.4	ORNL-Earthworm
Cobalt	7440-48-4	200	BTAG - Fauna
Copper	7440-50-8	80	ECO SSL
Iron	7439-89-6	200	ORNL - Microbial
Lead	7439-92-1	1,700	ECO SSL
Magnesium	7439-95-4	NV	--
Manganese	7439-96-5	450	ECO SSL
Mercury	7439-97-6	0.1	ORNL-Earthworm
Nickel	7440-02-0	280	ECO SSL
Potassium	7440-09-7	NV	--
Selenium	7782-49-2	4.1	ECO SSL
Silver	7440-22-4	50	ORNL - Microbial
Sodium	7440-23-5	NV	--
Vanadium	7440-62-2	20	ORNL - Microbial
Zinc	7440-66-6	120	Eco SSL
Pesticides/PCBs			
4,4'-DDE	72-55-9	0.1	BTAG - Fauna
4,4'-DDT	50-29-3	0.1	BTAG - Fauna
Aldrin	309-00-2	0.1	BTAG - Fauna
alpha-Chlordane [1]	5103-71-9	0.1	BTAG - Fauna
beta-BHC	319-85-7	NV	--
Endosulfan Sulfate	1031-07-8	NV	--
Endrin	72-20-8	0.1	BTAG - Fauna
Endrin Ketone	53494-70-5	0.1	BTAG - Fauna
gamma-BHC (Lindane)	58-89-9	0.1	BTAG - Fauna
gamma-Chlordane [1]	5103-74-2	0.1	BTAG - Fauna
Methoxychlor	72-43-5	0.1	BTAG - Fauna
Aroclor 1254	11097-69-1	NV	--
Aroclor 1260	11096-82-5	NV	--
TCL VOCs			
1,2,4-Trichlorobenzene	120-82-1	0.1	BTAG - Fauna
1,2-Dibromo-3-Chloropropane	96-12-8	NV	--
1,2-Dichlorobenzene	95-50-1	0.1	BTAG - Fauna
1,3-Dichlorobenzene	541-73-1	NV	--
1,4-Dichlorobenzene	106-46-7	20	ORNL-Earthworm
2-Butanone	78-93-3	NV	--
2-Hexanone	591-78-6	NV	--
4-Methyl-2-Pentanone	108-10-1	NV	--
Acetone	67-64-1	NV	--
Benzene	71-43-2	0.1	BTAG - Fauna
Bromomethane	74-83-9	NV	--
Carbon Disulfide	75-15-0	NV	--
Chlorobenzene	108-90-7	40	ORNL-Earthworm
Chloromethane	74-87-3	NV	--
Cyclohexane	110-82-7	NV	--
Dichlorodifluoromethane	75-71-8	NV	--
Ethylbenzene	100-41-4	0.1	BTAG - Fauna
Isopropylbenzene	98-82-8	NV	--
Methyl Acetate	79-20-9	NV	--
Methyl Tert-Butyl Ether	1634-04-4	NV	--

Table F.2-7
Invertebrate and Microbial Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
Methylcyclohexane	108-87-2	NV	--
Methylene Chloride	75-09-2	0.3	BTAG - Fauna
Styrene	100-42-5	0.1	BTAG - Fauna
Tetrachloroethene	127-18-4	0.3	BTAG - Fauna
Toluene	108-88-3	0.1	BTAG - Fauna
Trichloroethene	79-01-6	0.3	BTAG - Fauna
Xylenes (Total)	1330-20-7	NV	--
TCL SVOCs			
2,4-Dinitrotoluene	121-14-2	NV	--
2,6-Dinitrotoluene	606-20-2	NV	--
2-Methylnaphthalene	91-57-6	NV	--
Benzaldehyde	100-52-7	NV	--
Bis(2-ethylhexyl)phthalate	117-81-7	NV	--
Caprolactam	105-60-2	NV	--
Carbazole	86-74-8	NV	--
Di-n-butylphthalate	84-74-2	NV	--
Di-n-octylphthalate	117-84-0	NV	--
Dibenzofuran	132-64-9	NV	--
TCL PAHs			
Low Molecular Weight PAHs	--	29	ECO SSL
High Molecular Weight PAHs	--	18	ECO SSL

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
NV = No Value Available
TAL = Target Analyte List
TCL = Target Compound List
USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
ORNL - Earthworms - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
ORNL - Microbial Processes - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
BTAG - Fauna - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
[1] = Chlordane BTAG Screening Level Used
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon

Table F.2-8
Invertebrate and Microbial Screening - Soil
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Inorganics						
Aluminum	7429-90-5	28,500	NV	NC	NC	NC
Antimony	7440-36-0	1.3	78	1.7E-02	NC	NC
Arsenic	7440-38-2	55	60	9.2E-01	NC	NC
Barium	7440-39-3	191	330	5.8E-01	NC	NC
Beryllium	7440-41-7	1.5	40	3.8E-02	NC	NC
Cadmium	7440-43-9	0.75	140	5.4E-03	NC	NC
Calcium	7440-70-2	26,300	NV	NC	NC	NC
Chromium	7440-47-3	37.6	0.4	**9.4E+01**	25.95	**6.5E+01**
Cobalt	7440-48-4	13.2	200	6.6E-02	NC	NC
Copper	7440-50-8	76	80	9.5E-01	NC	NC
Iron	7439-89-6	32,000	200	**1.6E+02**	30,115	**1.5E+02**
Lead	7439-92-1	110	1,700	6.5E-02	NC	NC
Magnesium	7439-95-4	24,400	NV	NC	NC	NC
Manganese	7439-96-5	894	450	**2.0E+00**	416.2	9.2E-01
Mercury	7439-97-6	2.1	0.1	**2.1E+01**	0.933	**9.3E+00**
Nickel	7440-02-0	20.9	280	7.5E-02	NC	NC
Potassium	7440-09-7	5,240	NV	NC	NC	NC
Selenium	7782-49-2	3.3	4.1	8.0E-01	NC	NC
Silver	7440-22-4	0.2	50	4.0E-03	NC	NC
Sodium	7440-23-5	370	NV	NC	NC	NC
Vanadium	7440-62-2	56.9	20	**2.8E+00**	55.35	**2.8E+00**
Zinc	7440-66-6	148	120	**1.2E+00**	75.97	6.3E-01
Pesticides/PCBs						
4,4'-DDE	72-55-9	0.0018	0.1	1.8E-02	NC	NC
4,4'-DDT	50-29-3	0.0077	0.1	7.7E-02	NC	NC
Aldrin	309-00-2	0.0051	0.1	5.1E-02	NC	NC
alpha-Chlordane	5103-71-9	0.0032	0.1	3.2E-02	NC	NC
beta-BHC	319-85-7	0.012	NV	NC	NC	NC
Endosulfan Sulfate	1031-07-8	0.029	NV	NC	NC	NC
Endrin	72-20-8	0.0039	0.1	3.9E-02	NC	NC
Endrin Ketone	53494-70-5	0.024	0.1	2.4E-01	NC	NC
gamma-BHC (Lindane)	58-89-9	0.011	0.1	1.1E-01	NC	NC
gamma-Chlordane	5103-74-2	0.0076	0.1	7.6E-02	NC	NC
Methoxychlor	72-43-5	0.043	0.1	4.3E-01	NC	NC
Aroclor 1254	11097-69-1	2.1	NV	NC	NC	NC
Aroclor 1260	11096-82-5	0.62	NV	NC	NC	NC
TCL VOCs						
1,2,4-Trichlorobenzene	120-82-1	0.0007	0.1	7.0E-03	NC	NC
1,2-Dibromo-3-Chloropropane	96-12-8	0.0004	NV	NC	NC	NC
1,2-Dichlorobenzene	95-50-1	0.0008	0.1	8.0E-03	NC	NC
1,3-Dichlorobenzene	541-73-1	0.0009	NV	NC	NC	NC
1,4-Dichlorobenzene	106-46-7	0.001	20.0	5.0E-05	NC	NC
2-Butanone	78-93-3	0.04	NV	NC	NC	NC
2-Hexanone	591-78-6	0.002	NV	NC	NC	NC
4-Methyl-2-Pentanone	108-10-1	0.031	NV	NC	NC	NC
Acetone	67-64-1	0.46	NV	NC	NC	NC
Benzene	71-43-2	0.006	0.1	6.0E-02	NC	NC
Bromomethane	74-83-9	0.003	NV	NC	NC	NC
Carbon Disulfide	75-15-0	0.004	NV	NC	NC	NC
Chlorobenzene	108-90-7	0.0004	40.0	1.0E-05	NC	NC
Chloromethane	74-87-3	0.003	NV	NC	NC	NC
Cyclohexane	110-82-7	0.003	NV	NC	NC	NC
Dichlorodifluoromethane	75-71-8	0.003	NV	NC	NC	NC
Ethylbenzene	100-41-4	0.017	0.1	1.7E-01	NC	NC
Isopropylbenzene	98-82-8	0.003	NV	NC	NC	NC
Methyl Acetate	79-20-9	0.12	NV	NC	NC	NC
Methyl Tert-Butyl Ether	1634-04-4	0.002	NV	NC	NC	NC
Methylcyclohexane	108-87-2	0.027	NV	NC	NC	NC

Table F.2-8
Invertebrate and Microbial Screening - Soil
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Methylene Chloride	75-09-2	0.014	0.3	4.7E-02	NC	NC
Styrene	100-42-5	0.002	0.1	2.0E-02	NC	NC
Tetrachloroethene	127-18-4	0.001	0.3	3.3E-03	NC	NC
Toluene	108-88-3	0.019	0.1	1.9E-01	NC	NC
Trichloroethene	79-01-6	0.022	0.3	7.3E-02	NC	NC
Xylenes (Total)	1330-20-7	0.082	NV	NC	NC	NC
TCL SVOCs						
2,4-Dinitrotoluene	121-14-2	0.035	NV	NC	NC	NC
2,6-Dinitrotoluene	606-20-2	0.04	NV	NC	NC	NC
2-Methylnaphthalene	91-57-6	0.14	NV	NC	NC	NC
Benzaldehyde	100-52-7	0.066	NV	NC	NC	NC
Bis(2-ethylhexyl)phthalate	117-81-7	0.28	NV	NC	NC	NC
Caprolactam	105-60-2	0.8	NV	NC	NC	NC
Carbazole	86-74-8	0.2	NV	NC	NC	NC
Di-n-butylphthalate	84-74-2	0.14	NV	NC	NC	NC
Di-n-octylphthalate	117-84-0	0.5	NV	NC	NC	NC
Dibenzofuran	132-64-9	0.056	NV	NC	NC	NC
TCL PAHs						
Low Molecular Weight PAHs	--	2.32	29	8.0E-02	NC	NC
High Molecular Weight PAHs	--	4.26	18	2.4E-01	NC	NC

Notes:

CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
NV = No Value Available
NC = Not Calculated
Hazard Quotient = Soil Concentration/Screening Level
EPC = Exposure Point Concentration
See Table F.2-3b for Total Low and High Molecular Weight PAHs

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Table F.2-9
Wildlife Profiles
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

							Preliminary Assessment					Refined Assessment					
Representative Species			Composition of Diet [1] (%)				Minimum Body Weight [1]	Maximum Body Weight [1]	Maximum Food Ingestion Rate [2]	Maximum Substrate Ingestion Rate [1]		Average Body Weight [1]	Average Food Ingestion Rate [2]	Average Substrate Ingestion Rate [1]	Home Range (ha)	Proportion of Year Species Active	AUFs
Food-web Classification	Common Name	Scientific Name	Plants (incl. fungi)	Inverte-brates	Small mammals	Fish	kg	kg	kg dw/day	% of dry intake	kg dry wt./day	kg	kg dw/day	kg dry wt./day			Study Area (0.8) hectares
Birds																	
soil-probing invertivore	American robin	*Turdus migratorius*	62%	38%			0.0635	0.103	0.020	5%	0.001	0.077	0.016	0.0008	0.48	1	1
large carnivore	Red-tailed hawk	*Buteo jamaicensis*			100%		0.957	1.235	0.063	0%	0	1.134	0.059	0	250	1	0.0032
Mammals																	
small herbivore	Meadow vole	*Microtus pennsylvanicus*	100%				0.017	0.0524	0.010	2.4%	0.00024	0.037	0.008	0.00019	0.037	1	1
medium carnivore	Red fox	*Vulpes vulpes*	17%	4%	79%		2.95	7.04	0.342	2.8%	0.0096	4.53	0.238	0.0067	96	1	0.0084
small invertivore	Short-tailed shrew	*Blarina brevicauda*	14%	86%			0.0125	0.0225	0.003	13%	0.00039	0.015	0.002	0.00026	0.39	1	1

Notes:
kg = Kilogram
kg dw/day = Kilogram Dry-weight per Day
L/day = Liter per Day

[1]Wildlife Exposure Factors Handbook. U.S. Environmental Protection Agency (EPA). 1993. Office of Research and Development. 2 Volumes. EPA/600/R93/187a&b. December.
[2] Estimated food intake rate (kg [dw]/day) calculated as follows:
FI ((kg/day) = 0.0687 $Wt.^{0.882}$ for mammals (red fox and short-tailed shrew)
FI ((g/day) = 0.577 $Wt.^{0.727}$ for herbivores (meadow vole)
FI ((g/day) = 0.301 $Wt.^{0.751}$ for non-passerine birds (red-tailed hawk)
FI ((g/day) = 0.398 $Wt.^{0.850}$ for passerine birds (american robin)
The soil ingestion rate for the american robin set equal to 38% of the american woodcock value (0.34*10.4%=4%), based on a robin diet of 38% invertbrates.

Table F.2-10
Wildlife TRVs
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

	CAS #	AVIAN TEST SPECIES				MAMMALIAN TEST SPECIES					AVIAN RECEPTORS				MAMMALIAN RECEPTORS					
											American Robin		Red-tailed Hawk		Meadow Vole		Red Fox		Short-tailed Shrew	
		Chronic LOAEL	Chronic NOAEL	Test Animal	Source	Chronic LOAEL	Chronic NOAEL	Test Animal	Test Animal Body Weight (kg)	Source	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL
		(mg/kg-bw/d)				(mg/kg-bw/d)					(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)	
Arsenic	7440-38-2	1.28E+01	5.14E+00	mallard duck	ORNL 1996	1.26	0.126	mouse	0.03	ORNL 1996	1.28E+01	5.14E+00	1.28E+01	5.14E+00	1.20E+00	1.20E-01	3.59E-01	3.59E-02	1.50E+00	1.50E-01
Cadmium	7440-43-9	2.00E+01	1.45E+00	mallard duck	ORNL 1996	10	1	rat	0.3	ORNL 1996	2.00E+01	1.45E+00	2.00E+01	1.45E+00	1.69E+01	1.69E+00	5.07E+00	5.07E-01	2.11E+01	2.11E+00
Chromium	7440-47-3	5.00E+00	1.00E+00	black duck	ORNL 1996	32.8	3.28	rat	0.35	ORNL 1996	5.00E+00	1.00E+00	5.00E+00	1.00E+00	5.75E+01	5.75E+00	1.73E+01	1.73E+00	7.21E+01	7.21E+00
Copper	7440-50-8	6.17E+01	4.70E+01	1 day old chicks	ORNL 1996	15.4	11.7	mink	1	ORNL 1996	6.17E+01	4.70E+01	6.17E+01	4.70E+01	3.51E+01	2.67E+01	1.06E+01	8.02E+00	4.40E+01	3.34E+01
Lead	7439-92-1	1.13E+01	1.13E+00	Japanese quail	ORNL 1996	80	8	rat	0.35	ORNL 1996	1.13E+01	1.13E+00	1.13E+01	1.13E+00	1.40E+02	1.40E+01	4.22E+01	4.22E+00	1.76E+02	1.76E+01
Mercury	7439-97-6	9.00E-01	4.50E-01	Japanese Quail	ORNL 1996	132	13.2	mink	1	ORNL 1996	9.00E-01	4.50E-01	9.00E-01	4.50E-01	3.01E+02	3.01E+01	9.05E+01	9.05E+00	3.77E+02	3.77E+01
Nickel	7440-02-0	1.07E+02	7.74E+01	mallard duckling	ORNL 1996	80	40	rat	0.35	ORNL 1996	1.07E+02	7.74E+01	1.07E+02	7.74E+01	1.40E+02	7.01E+01	4.22E+01	2.11E+01	1.76E+02	8.79E+01
Selenium	7782-49-2	8.00E-01	4.00E-01	mallard duck	ORNL 1996	0.33	0.2	rat	0.35	ORNL 1996	8.00E-01	4.00E-01	8.00E-01	4.00E-01	5.79E-01	3.51E-01	1.74E-01	1.05E-01	7.25E-01	4.40E-01
Silver	7440-22-4	1.24E+02	1.66E+01	turkey	Matuk et al. 1981	222	22.2	rat	0.35	Matuk et al. 1981	1.24E+02	1.66E+01	1.24E+02	1.66E+01	3.89E+02	3.89E+01	1.17E+02	1.17E+01	4.88E+02	4.88E+01
Zinc	7440-66-6	1.31E+02	1.45E+01	white leghorn hen	ORNL 1996	320	160	rat	0.35	ORNL 1996	1.31E+02	1.45E+01	1.31E+02	1.45E+01	5.61E+02	2.81E+02	1.69E+02	8.44E+01	7.03E+02	3.52E+02
PAHs																				
Acenaphthene	83-32-9	5.05E+00	1.01E+00	red-winged blackbird	USACE 1998	87.5	17.5	mouse	0.03	USACE 1998	5.05E+00	1.01E+00	5.05E+00	1.01E+00	8.30E+01	1.66E+01	2.50E+01	4.99E+00	1.04E+02	2.08E+01
Acenaphthylene	208-96-8	--	--	--	USACE 1998	500	100	rat	0.35	USACE 1998	NV	NV	NV	NV	8.77E+02	1.75E+02	2.64E+02	5.27E+01	1.10E+03	2.20E+02
Benzo(a)anthracene	56-55-3	--	--	--	USACE 1998	2	0.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	2.91E+00	2.91E-01	8.74E-01	8.74E-02	3.64E+00	3.64E-01
Benzo(a)pyrene	50-32-8	2.50E+00	5.00E-01	duck	ORNL 1996	10	1	mouse	0.03	ORNL 1996	2.50E+00	5.00E-01	2.50E+00	5.00E-01	9.49E+00	9.49E-01	2.85E+00	2.85E-01	1.19E+01	1.19E+00
Benzo(b)fluoranthene	205-99-2	--	--	--	ORNL 1996	10	1	mouse	0.03	ORNL 1996	NV	NV	NV	NV	9.49E+00	9.49E-01	2.85E+00	2.85E-01	1.19E+01	1.19E+00
Benzo(g,h,i)perylene	191-24-2	--	--	--	USACE 1998	2.5	0.5	mouse	0.03	USACE 1998	NV	NV	NV	NV	2.37E+00	4.74E-01	7.13E-01	1.43E-01	2.97E+00	5.95E-01
Benzo(k)fluoranthene	207-08-9	--	--	--	USACE 1998	72	7.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.05E+02	1.05E+01	3.15E+01	3.15E+00	1.31E+02	1.31E+01
Chrysene	218-01-9	--	--	--	USACE 1998	99	9.9	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.44E+02	1.44E+01	4.32E+01	4.32E+00	1.80E+02	1.80E+01
Dibenzo(a,h)anthracene	53-70-3	--	--	--	USACE 1998	13.33	1.333	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.94E+01	1.94E+00	5.82E+00	5.82E-01	2.43E+01	2.43E+00
Fluoranthene	206-44-0	--	--	--	USACE 1998	100	20	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.45E+02	2.91E+01	4.37E+01	8.74E+00	1.82E+02	3.64E+01
Indeno(1,2,3-cd)pyrene	193-39-5	--	--	--	USACE 1998	72	7.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.05E+02	1.05E+01	3.15E+01	3.15E+00	1.31E+02	1.31E+01
Phenanthrene	85-01-8	5.65E+00	1.13E+00	red-winged blackbird	USACE 1998	35	7	mouse	0.03	USACE 1998	5.65E+00	1.13E+00	5.65E+00	1.13E+00	3.32E+01	6.64E+00	9.98E+00	2.00E+00	4.16E+01	8.32E+00
Pyrene	129-00-0	--	--	--	USACE 1998	40	8	mouse	0.03	USACE 1998	NV	NV	NV	NV	3.80E+01	7.59E+00	1.14E+01	2.28E+00	4.76E+01	9.51E+00
Pesticides																				
4,4'-DDE	72-55-9	5.80E-01	5.80E-02	mallard duck	Kornbrust et al. 1986	230	23	rat	0.35	Kornbrust et al. 1986	5.80E-01	5.80E-02	5.80E-01	5.80E-02	4.03E+02	4.03E+01	1.21E+02	1.21E+01	5.06E+02	5.06E+01
4,4'-DDT	50-29-3	2.80E-02	2.80E-03	brown pelican	ORNL 1996	4	0.8	rat	0.35	ORNL 1996	2.80E-02	2.80E-03	2.80E-02	2.80E-03	7.01E+00	1.40E+00	2.11E+00	4.22E-01	8.79E+00	1.76E+00
alpha-Chlordane	5103-71-9	1.07E+01	2.14E+00	red-winged blackbird	Chlordane Value	3.9	0.39	mouse	0.03	ATSDR 1994	1.07E+01	2.14E+00	1.07E+01	2.14E+00	3.70E+00	3.70E-01	1.11E+00	1.11E-01	4.64E+00	4.64E-01
delta-BHC	319-86-8	2.25E+00	5.60E-01	Japanese quail	ORNL 1996	0.14	0.014	mink	1	ORNL 1996	2.25E+00	5.60E-01	2.25E+00	5.60E-01	3.19E-01	3.19E-02	9.60E-02	9.60E-03	4.00E-01	4.00E-02
Endosulfan sulfate	1031-07-8	1.00E+02	1.00E+01	gray partridge	Endosulfan Value	0.26	0.026	mouse	0.35	Endosulfan Value	1.00E+02	1.00E+01	1.00E+02	1.00E+01	4.56E-01	4.56E-02	1.37E-01	1.37E-02	5.71E-01	5.71E-02
Endrin aldehyde	7421-93-4	1.70E-01	2.80E-02	mallard duck	Endrin Value	0.92	0.092	mouse	0.03	Endrin Value	1.70E-01	2.80E-02	1.70E-01	2.80E-02	8.73E-01	8.73E-02	2.62E-01	2.62E-02	1.09E+00	1.09E-01
gamma-BHC	58-89-9	2.00E+01	2.00E+00	mallard duck	ORNL 1996	80	8	rat	0.35	ORNL 1996	2.00E+01	2.00E+00	2.00E+01	2.00E+00	1.40E+02	1.40E+01	4.22E+01	4.22E+00	1.76E+02	1.76E+01
gamma-Chlordane	5103-74-2	1.06E+01	2.14E+00	red-winged blackbird	Chlordane Value	3.9	0.39	mouse	0.03	ATSDR 1994	1.06E+01	2.14E+00	1.06E+01	2.14E+00	3.70E+00	3.70E-01	1.11E+00	1.11E-01	4.64E+00	4.64E-01
Heptachlor	76-44-8	1.25E+01	2.50E+00	pheasant	ORNL 1996	1	0.1	mink	1	ORNL 1996	1.25E+01	2.50E+00	1.25E+01	2.50E+00	2.28E+00	2.28E-01	6.85E-01	6.85E-02	2.86E+00	2.86E-01
Heptachlor epoxide	1024-57-3	4.95E+00	9.90E-01	Japanese quail	USACE 1998	0.25	0.025	rat	0.35	USACE 1998	4.95E+00	9.90E-01	4.95E+00	9.90E-01	4.38E-01	4.38E-02	1.32E-01	1.32E-02	5.49E-01	5.49E-02
Methoxychlor	72-43-5	1.45E+02	1.45E+01	adult chicken	ORNL 1996	8	4	rat	0.35	ORNL 1996	1.45E+02	1.45E+01	1.45E+02	1.45E+01	1.40E+01	7.01E+00	4.22E+00	2.11E+00	1.76E+01	8.79E+00
PCBs																				
Aroclor 1254	11097-69-1	4.10E+00	4.10E-01	screech owl	Aroclor 1242 Value	0.68	0.068	oldfield mouse	0.03	ORNL 1996	4.10E+00	4.10E-01	4.10E+00	4.10E-01	6.45E-01	6.45E-02	1.94E-01	1.94E-02	8.09E-01	8.09E-02
Aroclor 1260	11096-82-5	4.10E+00	4.10E-01	screech owl	Aroclor 1242 Value	0.68	0.068	oldfield mouse	0.03	ORNL 1996	4.10E+00	4.10E-01	4.10E+00	4.10E-01	6.45E-01	6.45E-02	1.94E-01	1.94E-02	8.09E-01	8.09E-02
Dioxin/Furans																				
2,3,7,8-TCDD	1746-01-6	1.40E-04	1.40E-05	ring-necked pheasant	ORNL 1996	0.00001	0.000001	mouse	0.03	ORNL 1996	1.40E-04	1.40E-05	1.40E-04	1.40E-05	9.49E-06	9.49E-07	2.85E-06	2.85E-07	1.19E-05	1.19E-06

Notes:
CAS = Chemical Abstract Service
TRV = Toxic Reference Value
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw/d = Body Weight Per Day
kg = kilogram
PAH = Polynuclear Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
USACE = U.S. Army Corps of Engineers
ORNL = Oak Ridge National Laboratory
NOAEL and LOAEL values were derived from acute values by applying an uncertainty factor of 150.

Sources:

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Table F.2-11
Soil Biocaccumulation/Bioconcentration Factors- Soil to Plant Pathway
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

					Preliminary Assessment		Refined Assessment			
Chemical	CAS	Log K_{ow} Range	Selected K_{ow}	Source	BAF	Basis	C_s EPC (mg/kg)	BAF[1]	Basis	Source
Inorganics										
ARSENIC	7440-38-2	-- - --	--	--	1.103	90th percentile	25.61	0.0375	Median	Bechtel Jacobs 1998
CADMIUM	7440-43-9	-- - --	--	--	3.25	90th percentile	0.23	1.2120	$C_p = e^{(0.546*ln(Cs) - 0.475)}$	Bechtel Jacobs 1998
CHROMIUM	7440-47-3	-- - --	--	--	0.084	90th percentile	25.95	0.0410	Median	Bechtel Jacobs 1998
COPPER	7440-50-8	-- - --	--	--	0.625	90th percentile	39.10	0.2115	$C_p = e^{(0.394*ln(Cs) + 0.668)}$	Bechtel Jacobs 1998
LEAD	7439-92-1	-- - --	--	--	0.468	90th percentile	53.99	0.0460	$C_p = e^{(0.561*ln(Cs) - 1.328)}$	Bechtel Jacobs 1998
MERCURY	7439-97-6	-- - --	--	--	5.0	90th percentile	0.93	0.3816	$C_p = e^{(0.544*ln(Cs) - 0.995)}$	Bechtel Jacobs 1998
NICKEL	7440-02-0	-- - --	--	--	1.411	90th percentile	NC	NC	$C_p = e^{(0.748*ln(Cs) + 2.223)}$	Bechtel Jacobs 1998
SELENIUM	7782-49-2	-- - --	--	--	3.012	90th percentile	1.66	0.5355	$C_p = e^{(1.104*ln(Cs) - 0.677)}$	Bechtel Jacobs 1998
SILVER	7440-22-4	-- - --	--	--	0.037	90th percentile	NC	0.0140	Median	Bechtel Jacobs 1998
ZINC	7440-66-6	-- - --	--	--	1.82	90th percentile	75.97	0.7002	$C_p = e^{(0.554*ln(Cs) + 1.575)}$	Bechtel Jacobs 1998
Pesticides										
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	0.08	Maximum	NC	NC	$C_p = e^{(0.752*ln(Cs) - 2.512)}$	USEPA 2005
4,4'-DDT	50-29-3	5.56 - 7.01	6.53	USEPA 1995	0.62	Maximum	0.01	0.2708	$C_p = e^{(0.752*ln(Cs) - 2.512)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	0.0086	K_{ow} Regression Eq.	Travis and Arms 1988
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	1	Default Value	NC	0.1653	K_{ow} Regression Eq.	Travis and Arms 1988
ENDOSULFAN SULFATE	1031-07-8	-- - --	--	--	1	Default Value	NC	0.2367	Endosulfan as Surrogate	--
ENDRIN ALDEHYDE	7421-93-4	-- - --	--	--	1	Default Value	NC	0.0461	Endrin as Surrogate	--
GAMMA-BHC (LINDANE)	58-89-9	3.61 - 3.9	3.73	USEPA 1995	1	Default Value	NC	0.2704	K_{ow} Regression Eq.	Travis and Arms 1988
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	0.0086	K_{ow} Regression Eq.	Travis and Arms 1988
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	1	Default Value	NC	0.0093	K_{ow} Regression Eq.	Travis and Arms 1988
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1	Default Value	NC	0.0499	K_{ow} Regression Eq.	Travis and Arms 1988
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	1	Default Value	NC	0.0448	K_{ow} Regression Eq.	Travis and Arms 1988
PCBs										
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	0.0068	K_{ow} Regression Eq.	0.52	0.0068	K_{ow} Regression Eq.	Travis and Arms 1988
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	0.0045	K_{ow} Regression Eq.	0.05	0.0045	K_{ow} Regression Eq.	Travis and Arms 1988
VOCs and SVOCs										
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	4.6	Anthracene as Surrogate	0.33	0.0304	$C_p = e^{(-0.8556*ln(Cs) - 5.562)}$	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.1	USEPA 1995	4.6	Anthracene as Surrogate	0.11	0.5072	$C_p = e^{(0.791*ln(Cs) - 1.144)}$	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	0.54	Maximum	0.10	0.1698	$C_p = e^{(0.5944*ln(Cs) - 2.708)}$	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	3.3	Maximum	0.12	0.1342	$C_p = e^{(0.975*ln(Cs) - 2.0615)}$	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	0.48	Maximum	0.26	0.31	Median BAF	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1.6	Maximum	0.05	0.2241	$C_p = e^{(1.183*ln(Cs) - 0.931)}$	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	1.0	Maximum	0.13	0.1536	$C_p = e^{(0.860*ln(Cs) - 2.158)}$	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	1.05	Maximum	0.35	0.1024	$C_p = e^{(0.594*ln(Cs) - 2.708)}$	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	0.23	Maximum	0.04	0.13	Median BAF	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	5.12	USEPA 1995	6.0	Maximum	1.01	0.50	Median BAF	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.65	USEPA 1995	0.15	Maximum	0.09	0.11	Median BAF	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	11	Maximum	0.15	1.7579	$C_p = e^{(0.620*ln(Cs) - 0.167)}$	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	5.11	USEPA 1995	3.7	Maximum	0.51	0.72	Median BAF	USEPA 2005
Dioxin/Furans										
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	0.0075	K_{ow} Regression Eq.	NC	0.0065	K_{ow} Regression Eq.	Travis and Arms 1988

Notes:
CAS = Chemical Abstract Services
BAF = Bioaccumulation Factor
K_{ow} = Chemical octanol-water coefficient
NC = Not Calculated
C_s = Chemical Concentration in Soil
C_p = Chemical Concentration in Plant Matter (dry weight)
[1] = BAFs for chemical using Cp regression equation calculated by as follows: BAF = C_p/C_s

Source(s):

USEPA 1995: United States Environmental Protection Agency. 1995. Karickhoff, S.W. , and J.M. Long. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.
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K_{ow} Regression Equation: BAF =10^((-0.578*K_{ow})+1.588))

Table F.2-12
Soil Biocaccumulation/Bioconcentration Factors - Soil to Invertebrate Pathway
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

							Preliminary Assessment		Refined Assessment			
Chemical	**CAS**	**Log K_{ow} Range**	**Selected Log K_{ow}**	**Reference**	**K_{oc}**	**Reference**	**Value**	**Basis**	**C_s EPC (mg/kg)**	**BAF[1]**	**Basis**	**Source**
Inorganics												
ARSENIC	7440-38-2	-- - --	--	--	--	--	0.52	90th percentile	25.61	0.0931	$C_e = e^{(0.706*ln(Cs) - 1.421)}$	Sample et al. 1998
CADMIUM	7440-43-9	-- - --	--	--	--	--	40.7	90th percentile	0.23	11.1929	$C_e = e^{(0.795*ln(Cs) + 2.114)}$	Sample et al. 1998
CHROMIUM	7440-47-3	-- - --	--	--	--	--	3.16	90th percentile	25.95	0.31	Median	Sample et al. 1998
COPPER	7440-50-8	-- - --	--	--	--	--	1.53	90th percentile	39.1	0.52	Median	Sample et al. 1998
LEAD	7439-92-1	-- - --	--	--	--	--	1.52	90th percentile	53.99	0.3724	$C_e = e^{(0.807*ln(Cs) - 0.218)}$	Sample et al. 1998
MERCURY	7439-97-6	-- - --	--	--	--	--	20.6	90th percentile	0.933	1.69	Median	Sample et al. 1998
NICKEL	7440-02-0	-- - --	--	--	--	--	4.73	90th percentile	NC	1.06	Median	Sample et al. 1998
SELENIUM	7782-49-2	-- - --	--	--	--	--	1.34	90th percentile	1.657	0.8107	$C_e = e^{(0.733*ln(Cs) - 0.075)}$	Sample et al. 1998
SILVER	7440-22-4	-- - --	--	--	--	--	15.3	90th percentile	NC	2.05	Median	Sample et al. 1998
ZINC	7440-66-6	-- - --	--	--	--	--	12.9	90th percentile	75.97	4.6600	$C_e = e^{(0.328*ln(Cs) + 4.449)}$	Sample et al. 1998
Pesticides												
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	--	--	20.1	90th percentile	NC	NC	$C_e = e^{(0.88*ln(Cs) + 2.4771)}$	USEPA 2005
4,4'-DDT	50-29-3	5.56 - 7.01	6.53	USEPA 1995	--	--	29.4	90th percentile	0.0077	13.9214	$C_e = e^{(0.8689*ln(Cs) + 2.1287)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	5.89E+04	SRC, CF	4.00	Not Specified	NC	4.00	Not Specified	Edwards and Bohlen 1992
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	4.26E+03	SRC, CF	3.18	Jager Model	NC	3.18	Jager Model	USEPA 2005
ENDOSULFAN SULFATE	1031-07-8	-- - --	--	--	--	--	2.21	Endosulfan as Surrogate	NC	2.12	Endosulfan as Surrogate	--
ENDRIN ALDEHYDE	7421-93-4	-- - --	--	--	--	--	3.60	Endrin as Surrogate	NC	3.60	Endrin as Surrogate	--
GAMMA-BHC (LINDANE)	58-89-9	3.61 - 3.9	3.73	USEPA 1995	1.08E+03	SRC, CF	8.41	Jager Model	NC	5.98	Jager Model	USEPA 2005
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	5.89E+04	SRC, CF	4.00	Not Specified	NC	4.00	Not Specified	Edwards and Bohlen 1992
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	3.48E+03	SRC, CF	3.00	Not Specified	NC	3.00	Not Specified	Edwards and Bohlen 1992
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1.06E+01	SRC, CF	8.39	Not Specified	NC	8.39	Not Specified	USEPA 1999
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	8.00E+04	SRC, CF	3.42	Jager Model	NC	1.21	Jager Model	USEPA 2005
PCBs												
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	--	--	15.9	90th percentile	0.523	6.67	Median	Sample et al. 1998
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	--	--	15.9	90th percentile	0.0546	6.67	Median	Sample et al. 1998
VOCs and SVOCs												
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	1.09E+04	USEPA 2005	2.72	Jager Model	0.328	0.87	Jager Model	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.07	USEPA 1995	9.47E+02	USEPA 2005	13.49	Jager Model	0.108	13.49	Jager Model	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	3.58E+05	USEPA 2005	1.12	Jager Model	0.0998	0.93	Jager Model	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	9.69E+05	USEPA 2005	1.24	Jager Model	0.12	0.78	Jager Model	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	5.96E+05	USEPA 2005	2.28	Jager Model	0.262	1.53	Jager Model	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1.43E+06	USEPA 2005	3.50	Jager Model	0.0457	1.73	Jager Model	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	5.96E+05	USEPA 2005	1.76	Jager Model	0.132	1.53	Jager Model	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	2.48E+05	USEPA 2005	1.62	Jager Model	0.347	1.35	Jager Model	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	1.79E+06	USEPA 2005	1.99	Jager Model	0.0368	1.36	Jager Model	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	4.95	USEPA 1995	4.17E+04	USEPA 2005	4.31	Jager Model	1.006	1.79	Jager Model	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.58	USEPA 1995	1.17E+06	USEPA 2005	2.21	Jager Model	0.0931	1.68	Jager Model	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	3.30E+04	USEPA 2005	1.05	Jager Model	0.146	1.01	Jager Model	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	4.88	USEPA 1995	6.27E+04	USEPA 2005	3.72	Jager Model	0.512	1.03	Jager Model	USEPA 2005
Dioxin/Furans												
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	--	--	22.2	90th percentile	NC	11.0	Median	Sample et al. 1998

Notes:
CAS = Chemical Abstract Services
C_s = Chemical Concentration in Soil
C_e = Chemical Concentration in Earthworm (dry weight)
K_{ow} = Chemical octanol-water coefficient
K_{oc} = Chemical water to soil partitioning coefficient
K_{ww} = Chemical worm to soil partitioning coefficient
foc = mean fraction organic content in soil (0.0112 mean from physical samples - see Appendix C.1)
[1] = BAFs for chemical using Ce regression equation calculated by as follows: BAF = C_e/C_s

Source(s):
USEPA 1995: United States Environmental Protection Agency. Karickhoff, S.W. , and J.M. Long. 1995. Summary of Measured, Calculated, and Recommended $Log K_{ow}$ Values. Environmental Research Laboratory. Athens, Georgia.
Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision
Sample et al. 1998: Sample, B.E., Beauchamp, J.J., Efroymson, R.A., Sutter, G.W., Ashwood, T.L., February 1998. Development and Validation of Bioaccumulation Models for Earthworms.
Jager Model: As presented in USEPA 2005, Guidance for Developing Ecological Screening Levels, Appendix 4-1, Table 5.
BAF = K_{ww}(L/kg worl dw)/K_d (L/kg soil dw)
K_{ww} (dry weight) = 10^(0.87*logK_{ow} - 2.0) / 0.16
Wet weight to dry weight assuming 16% solids
$K_d = f_{oc} * K_{oc}$
foc = 0.017 from site specific physical soil data
Note: The maximum Kow utilized for the Tier I calculation and the Selected Kow utilized for the Tier II calculation.
Edwards and Bohlen 1992: Edwards, C.A. and Bohlen, P.J. 1992. The effects of toxic chemicals on earthworms. Reviews of Environmental Contamination and Toxicology, 125: 23-99.
USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.
SRC/CF: Syracuse Research Corporation (SRC). Physical Properties Database. http://www.syrres.com/esc/physdemo.htm

Table F.2-13
Soil Bioaccumulation/Bioconcentration Factors - Soil to Mammal Pathway
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS	Log K_{ow} Range	Selected K_{ow}	Reference	Preliminary Assessment		Refined Assessment			Source
					Value	Basis	C_s (mg/kg)	BAF[1]	Basis	
Inorganics										
ARSENIC	7440-38-2	-- - --	--	--	0.0149	90th percentile	25.61	0.0044	$C_m = e^{(0.819*ln(Cs) - 4.847)}$	Sample et al. 1998
CADMIUM	7440-43-9	-- - --	--	--	3.991	90th percentile	0.23	0.6178	$C_m = e^{(0.472*ln(Cs) - 1.257)}$	Sample et al. 1998
CHROMIUM	7440-47-3	-- - --	--	--	0.333	90th percentile	25.95	0.0976	$C_m = e^{(0.734*ln(Cs) - 1.46)}$	Sample et al. 1998
COPPER	7440-50-8	-- - --	--	--	1.045	90th percentile	39.1	0.3346	$C_m = e^{(0.144*ln(Cs) + 2.042)}$	Sample et al. 1998
LEAD	7439-92-1	-- - --	--	--	0.286	90th percentile	53.99	0.1166	$C_m = e^{(0.442*ln(Cs) + 0.0761)}$	Sample et al. 1998
MERCURY	7439-97-6	-- - --	--	--	0.192	90th percentile	0.933	0.0543	Median	Sample et al. 1998
NICKEL	7440-02-0	-- - --	--	--	0.589	90th percentile	NC	NC	$C_m = e^{(0.466*ln(Cs) - 0.246)}$	Sample et al. 1998
SELENIUM	7782-49-2	-- - --	--	--	1.187	90th percentile	1.657	0.4816	$C_m = e^{(0.376*ln(Cs) -0.416)}$	Sample et al. 1998
SILVER	7440-22-4	-- - --	--	--	0.501	90th percentile	NC	0.004	Median	Sample et al. 1998
ZINC	7440-66-6	-- - --	--	--	2.69	90th percentile	75.97	1.4030	$C_m = e^{(0.071*ln(Cs) + 4.363)}$	Sample et al. 1998
Pesticides										
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	1	Default Value	NC	NC	$C_m = e^{(0.641*ln(Cd) + 3.640)}$	USEPA 2005
4,4'-DDT	50-29-3	5.56 - 7.01	6.53	USEPA 1995	1	Default Value	NC	NC	$C_m = e^{(0.725*ln(Cd) + 1.179)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	1	Default Value	--
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	1	Default Value	NC	1	Default Value	--
ENDOSULFAN SULFATE	1031-07-8	-- - --	--	--	1	Default Value	NC	1	Default Value	--
ENDRIN ALDEHYDE	7421-93-4	-- - --	--	--	1	Default Value	NC	1	Default Value	--
GAMMA-BHC (LINDANE)	58-89-9	3.61 - 3.9	3.73	USEPA 1995	1	Default Value	NC	1	Default Value	--
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	1	Default Value	--
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	1	Default Value	NC	1	Default Value	--
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1	Default Value	NC	1	Default Value	--
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	1	Default Value	NC	1	Default Value	--
PCBs										
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	1	Default Value	0.523	1	Default Value	--
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	1	Default Value	0.0546	1	Default Value	--
VOCs and SVOCs										
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	1	Default Value	0.328	0	--	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.07	USEPA 1995	1	Default Value	0.108	0	--	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	1	Default Value	0.0998	0	--	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	1	Default Value	0.12	0	--	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	1	Default Value	0.262	0	--	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1	Default Value	0.0457	0	--	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	1	Default Value	0.132	0	--	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	1	Default Value	0.347	0	--	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	1	Default Value	0.0368	0	--	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	5.12	USEPA 1995	1	Default Value	1.006	0	--	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.65	USEPA 1995	1	Default Value	0.0931	0	--	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	1	Default Value	0.146	0	--	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	5.11	USEPA 1995	1	Default Value	0.512	0	--	USEPA 2005
Dioxin/Furans										
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	2.2	90th percentile	0.00000959	0.7199	$C_m = e^{(0.1089*ln(Cs) + 0.7044)}$	Sample et al. 1998

Notes:
CAS = Chemical Abstract Services
C_s = Chemical Concentration in Soil
C_d = Chemical Concentration in Prey (assumed to be 100% earthworms (dry weight))
C_m = Chemical Concentration in Mammal (dry weight)
K_{ow} = Chemical octanol to water partitioning coefficient
[1] = BAFs for chemical using Ce regression equation calculated by as follows: BAF = C_m/C_s

Source(s):
USEPA 1995: United States Environmental Protection Agency. Karickhoff, S.W. , and J.M. Long. 1995. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.
Sample et al. 1998: Sample et al. 1998. Development and Validation of Bioaccumulation Models for Small Mammals.
Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision
USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.
Travis and Arms 1988: Travis and Arms. 1988. Bioconcentration of Organics in Beef, Milk, and Vegetation. BAF values calculated for Tier I using lowest Kow value and for Tier II using the selected Kow value.
K_{ow} Regression Equation: BAF =10^((-0.578*K_{ow})+1.588))

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Table F.2-14
Preliminary Wildlife Risk Characterization - Meadow Vole
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics													
Arsenic	7440-38-2	1.20E-01	1.20E+00	55	1.1E+00	6.1E+01	1.8E-01	1.8E+00	**3.05E+02**	**3.0E+01**	**Y**	25.61	**1.4E+02**
Cadmium	7440-43-9	1.69E+00	1.69E+01	0.75	3.3E+00	2.4E+00	8.8E-01	8.8E+00	8.6E-01	8.6E-02	N	--	--
Chromium	7440-47-3	5.75E+00	5.75E+01	37.6	8.4E-02	3.2E+00	9.1E+01	9.1E+02	4.2E-01	4.2E-02	N	--	--
Copper	7440-50-8	2.67E+01	3.51E+01	76	6.3E-01	4.8E+01	7.0E+01	9.2E+01	**1.1E+00**	8.3E-01	**Y**	39.1	5.6E-01
Lead	7439-92-1	1.40E+01	1.40E+02	110	4.7E-01	5.1E+01	4.8E+01	4.8E+02	**2.3E+00**	2.3E-01	**Y**	53.99	**1.1E+00**
Mercury	7439-97-6	3.01E+01	3.01E+02	2.1	5.0E+00	1.1E+01	1.0E+01	1.0E+02	2.1E-01	2.1E-02	N	--	--
Nickel	7440-02-0	7.01E+01	1.40E+02	20.9	1.4E+00	2.9E+01	8.3E+01	1.7E+02	2.5E-01	1.3E-01	N	--	--
Selenium	7782-49-2	3.51E-01	5.79E-01	3.3	3.0E+00	9.9E+00	2.0E-01	3.2E-01	**1.7E+01**	**1.0E+01**	**Y**	1.657	**8.4E+00**
Silver	7440-22-4	3.89E+01	3.89E+02	0.2	3.7E-02	7.4E-03	1.1E+03	1.1E+04	1.8E-04	1.8E-05	N	--	--
Zinc	7440-66-6	2.81E+02	5.61E+02	148	1.8E+00	2.7E+02	2.6E+02	5.2E+02	5.7E-01	2.9E-01	N	--	--
Dioxin/Furans													
Total 2,3,7,8-TCDD Equivalents	1746-01-6	9.49E-07	9.49E-06	7.1E-06	7.5E-03	5.4E-08	5.1E-05	5.1E-04	1.4E-01	1.4E-02	N	--	--
Pesticides/PCBs													
4,4'-DDE	72-55-9	4.03E+01	4.03E+02	0.0018	8.0E-02	1.4E-04	6.6E+02	6.6E+03	2.7E-06	2.7E-07	N	--	--
4,4'-DDT	50-29-3	1.40E+00	7.01E+00	0.0077	6.2E-01	4.8E-03	3.7E+00	1.9E+01	2.1E-03	4.2E-04	N	--	--
Aldrin	309-00-2	3.51E-01	1.75E+00	0.0051	1.0E+00	5.1E-03	5.8E-01	2.9E+00	8.8E-03	1.8E-03	N	--	--
alpha-Chlordane	5103-71-9	3.70E-01	3.70E+00	0.0032	1.0E+00	3.2E-03	6.1E-01	6.1E+00	5.2E-03	5.2E-04	N	--	--
beta-BHC	319-85-7	7.01E-01	3.51E+00	0.012	1.0E+00	1.2E-02	1.2E+00	5.8E+00	1.0E-02	2.1E-03	N	--	--
Endosulfan Sulfate	1031-07-8	4.56E-02	4.56E-01	0.029	1.0E+00	2.9E-02	7.6E-02	7.6E-01	3.8E-01	3.8E-02	N	--	--
Endrin	72-20-8	8.73E-02	8.73E-01	0.0039	1.0E+00	3.9E-03	1.4E-01	1.4E+00	2.7E-02	2.7E-03	N	--	--
Endrin Ketone	53494-70-5	8.73E-02	8.73E-01	0.024	1.0E+00	2.4E-02	1.4E-01	1.4E+00	1.7E-01	1.7E-02	N	--	--
gamma-BHC (Lindane)	58-89-9	1.40E+01	1.40E+02	0.011	1.0E+00	1.1E-02	2.3E+01	2.3E+02	4.7E-04	4.7E-05	N	--	--
gamma-Chlordane	5103-74-2	3.70E-01	3.70E+00	0.0076	1.0E+00	7.6E-03	6.1E-01	6.1E+00	1.2E-02	1.2E-03	N	--	--
Methoxychlor	72-43-5	7.01E+00	1.40E+01	0.043	1.0E+00	4.3E-02	1.2E+01	2.3E+01	3.7E-03	1.8E-03	N	--	--
Aroclor 1254	11097-69-1	6.45E-02	6.45E-01	2.1	6.8E-03	1.4E-02	3.6E+00	3.6E+01	5.9E-01	5.9E-02	N	--	--
Aroclor 1260	11096-82-5	6.45E-02	6.45E-01	0.62	4.5E-03	2.8E-03	3.8E+00	3.8E+01	1.6E-01	1.6E-02	N	--	--
TCL PAHs													
Acenaphthene	83-32-9	1.66E+01	8.30E+01	1.2	4.6E+00	5.5E+00	6.1E+00	3.1E+01	2.0E-01	3.9E-02	N	--	--
Acenaphthylene	208-96-8	1.75E+02	8.77E+02	0.22	4.6E+00	1.0E+00	6.4E+01	3.2E+02	3.4E-03	6.8E-04	N	--	--
Anthracene	120-12-7	4.80E+02	4.80E+03	0.12	4.6E+00	5.5E-01	1.8E+02	1.8E+03	6.8E-04	6.8E-05	N	--	--
Benzo(a)anthracene	56-55-3	2.91E-01	2.91E+00	0.39	5.4E-01	2.1E-01	8.8E-01	8.8E+00	4.5E-01	4.5E-02	N	--	--
Benzo(a)pyrene	50-32-8	9.49E-01	9.49E+00	0.3	3.3E+00	9.9E-01	4.9E-01	4.9E+00	6.2E-01	6.2E-02	N	--	--
Benzo(b)fluoranthene	205-99-2	9.49E-01	9.49E+00	0.57	4.8E-01	2.7E-01	3.2E+00	3.2E+01	1.8E-01	1.8E-02	N	--	--
Benzo(g,h,i)perylene	191-24-2	4.74E-01	2.37E+00	0.14	1.6E+00	2.2E-01	5.0E-01	2.5E+00	2.8E-01	5.6E-02	N	--	--
Benzo(k)fluoranthene	207-08-9	1.05E+01	1.05E+02	0.37	1.0E+00	3.7E-01	1.7E+01	1.7E+02	2.1E-02	2.1E-03	N	--	--
Chrysene	218-01-9	1.44E+01	1.44E+02	0.68	1.1E+00	7.1E-01	2.3E+01	2.3E+02	3.0E-02	3.0E-03	N	--	--
Dibenz(a,h)anthracene	53-70-3	1.94E+00	1.94E+01	0.11	2.3E-01	2.5E-02	1.3E+01	1.3E+02	8.5E-03	8.5E-04	N	--	--
Fluoranthene	206-44-0	2.91E+01	1.45E+02	1.5	6.0E+00	9.0E+00	8.2E+00	4.1E+01	1.8E-01	3.7E-02	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	1.05E+01	1.05E+02	0.25	1.5E-01	3.8E-02	1.0E+02	1.0E+03	2.4E-03	2.4E-04	N	--	--
Phenanthrene	85-01-8	6.64E+00	3.32E+01	0.55	1.1E+01	6.1E+00	1.0E+00	5.1E+00	5.4E-01	1.1E-01	N	--	--
Pyrene	129-00-0	7.59E+00	3.80E+01	0.81	3.7E+00	3.0E+00	3.5E+00	1.7E+01	2.3E-01	4.7E-02	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Meadow Vole Specific Data from Table F.2-9

BW=	0.017	kg
IR_{food} =	0.010	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00024	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-15
Refined Wildlife Risk Characterization - Meadow Vole
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment						
				Soil						
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics										
Arsenic	7440-38-2	1.20E-01	1.20E+00	25.61	3.8E-02	9.6E-01	9.0E+00	9.0E+01	**2.8E+00**	2.8E-01
Copper	7440-50-8	2.67E+01	3.51E+01	39.1	2.1E-01	8.3E+00	5.2E+02	6.9E+02	7.5E-02	5.7E-02
Lead	7439-92-1	1.40E+01	1.40E+02	53.99	4.6E-02	2.5E+00	9.3E+02	9.3E+03	5.8E-02	5.8E-03
Selenium	7782-49-2	3.51E-01	5.79E-01	1.657	5.4E-01	8.9E-01	2.9E+00	4.8E+00	5.7E-01	3.5E-01

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Meadow Vole Specific Data from Table F.2-9

BW=	0.037	kg
IR_{food} =	0.008	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	1.00	unitless
IR_{soil} =	0.00019	kg dw/day
AF =	1	unitless

Table F.2-16
Preliminary Wildlife Risk Characterization - Short-tailed Shrew
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																
Arsenic	7440-38-2	1.50E-01	1.50E+00	55	1.1E+00	6.1E+01	5.2E-01	2.9E+01	Plant	5.1E-01	5.1E+00	**1.1E+02**	**1.1E+01**	**Y**	25.61	**5.1E+01**
Cadmium	7440-43-9	2.11E+00	2.11E+01	0.75	3.3E+00	2.4E+00	4.1E+01	3.1E+01	Invertebrate	2.2E-01	2.2E+00	**3.5E+00**	3.5E-01	**Y**	0.23	**1.1E+00**
Chromium	7440-47-3	7.21E+00	7.21E+01	37.6	8.4E-02	3.2E+00	3.2E+00	1.2E+02	Invertebrate	9.1E+00	9.1E+01	**4.1E+00**	4.1E-01	**Y**	25.95	**2.8E+00**
Copper	7440-50-8	3.34E+01	4.40E+01	76	6.3E-01	4.8E+01	1.5E+00	1.2E+02	Invertebrate	8.4E+01	1.1E+02	9.1E-01	6.9E-01	N	--	--
Lead	7439-92-1	1.76E+01	1.76E+02	110	4.7E-01	5.1E+01	1.5E+00	1.7E+02	Invertebrate	4.4E+01	4.4E+02	**2.5E+00**	2.5E-01	**Y**	53.99	**1.2E+00**
Mercury	7439-97-6	3.77E+01	3.77E+02	2.1	5.0E+00	1.1E+01	2.1E+01	4.3E+01	Invertebrate	7.6E+00	7.6E+01	2.8E-01	2.8E-02	N	--	--
Nickel	7440-02-0	8.79E+01	1.76E+02	20.9	1.4E+00	2.9E+01	4.7E+00	9.9E+01	Invertebrate	7.5E+01	1.5E+02	2.8E-01	1.4E-01	N	--	--
Selenium	7782-49-2	4.40E-01	7.25E-01	3.3	3.0E+00	9.9E+00	1.3E+00	4.4E+00	Plant	5.8E-01	9.6E-01	**5.7E+00**	**3.4E+00**	**Y**	1.657	**2.8E+00**
Silver	7440-22-4	4.88E+01	4.88E+02	0.2	3.7E-02	7.4E-03	1.5E+01	3.1E+00	Invertebrate	1.3E+01	1.3E+02	1.5E-02	1.5E-03	N	--	--
Zinc	7440-66-6	3.52E+02	7.03E+02	148	1.8E+00	2.7E+02	1.3E+01	1.9E+03	Invertebrate	1.1E+02	2.3E+02	**1.3E+00**	6.6E-01	**Y**	75.97	6.7E-01
Dioxin/Furans																
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.19E-06	1.19E-05	7.1E-06	7.5E-03	5.4E-08	2.2E+01	1.6E-04	Invertebrate	2.2E-07	2.2E-06	**3.2E+01**	**3.2E+00**	**Y**	9.59E-06	**4.3E+01**
Pesticides/PCBs																
4,4'-DDE	72-55-9	5.06E+01	5.06E+02	0.0018	8.0E-02	1.4E-04	2.0E+01	3.6E-02	Invertebrate	1.0E+01	1.0E+02	1.7E-04	1.7E-05	N	--	--
4,4'-DDT	50-29-3	1.76E+00	8.79E+00	0.0077	6.2E-01	4.8E-03	2.9E+01	2.3E-01	Invertebrate	2.5E-01	1.2E+00	3.1E-02	6.2E-03	N	--	--
Aldrin	309-00-2	4.40E-01	2.20E+00	0.0051	1.0E+00	5.1E-03	3.3E+00	1.7E-02	Invertebrate	5.3E-01	2.7E+00	9.6E-03	1.9E-03	N	--	--
alpha-Chlordane	5103-71-9	4.64E-01	4.64E+00	0.0032	1.0E+00	3.2E-03	4.0E+00	1.3E-02	Invertebrate	4.7E-01	4.7E+00	6.8E-03	6.8E-04	N	--	--
beta-BHC	319-85-7	8.79E-01	4.40E+00	0.012	1.0E+00	1.2E-02	1.9E+00	2.3E-02	Invertebrate	1.8E+00	9.0E+00	6.6E-03	1.3E-03	N	--	--
Endosulfan Sulfate	1031-07-8	5.71E-02	5.71E-01	0.029	1.0E+00	2.9E-02	2.2E+00	6.4E-02	Invertebrate	1.0E-01	1.0E+00	2.9E-01	2.9E-02	N	--	--
Endrin	72-20-8	1.09E-01	1.09E+00	0.0039	1.0E+00	3.9E-03	3.6E+00	1.4E-02	Invertebrate	1.2E-01	1.2E+00	3.2E-02	3.2E-03	N	--	--
Endrin Ketone	53494-70-5	1.09E-01	1.09E+00	0.024	1.0E+00	2.4E-02	3.6E+00	8.6E-02	Invertebrate	1.2E-01	1.2E+00	2.0E-01	2.0E-02	N	--	--
gamma-BHC (Lindane)	58-89-9	1.76E+01	1.76E+02	0.011	1.0E+00	1.1E-02	8.4E+00	9.2E-02	Invertebrate	8.6E+00	8.6E+01	1.3E-03	1.3E-04	N	--	--
gamma-Chlordane	5103-74-2	4.64E-01	4.64E+00	0.0076	1.0E+00	7.6E-03	4.0E+00	3.0E-02	Invertebrate	4.7E-01	4.7E+00	1.6E-02	1.6E-03	N	--	--
Methoxychlor	72-43-5	8.79E+00	1.76E+01	0.043	1.0E+00	4.3E-02	3.4E+00	1.5E-01	Invertebrate	1.0E+01	2.1E+01	4.2E-03	2.1E-03	N	--	--
Aroclor 1254	11097-69-1	8.09E-02	8.09E-01	2.1	6.8E-03	1.4E-02	1.6E+01	3.3E+01	Invertebrate	2.1E-02	2.1E-01	**1.0E+02**	**1.0E+01**	**Y**	0.523	**2.5E+01**
Aroclor 1260	11096-82-5	8.09E-02	8.09E-01	0.62	4.5E-03	2.8E-03	1.6E+01	9.9E+00	Invertebrate	2.1E-02	2.1E-01	**2.9E+01**	**2.9E+00**	**Y**	0.0546	**2.6E+00**
TCL PAHs																
Acenaphthene	83-32-9	2.08E+01	1.04E+02	1.2	4.6E+00	5.5E+00	2.7E+00	3.3E+00	Plant	1.8E+01	9.2E+01	6.5E-02	1.3E-02	N	--	--
Acenaphthylene	208-96-8	2.20E+02	1.10E+03	0.22	4.6E+00	1.0E+00	1.3E+01	3.0E+00	Invertebrate	6.7E+01	3.4E+02	3.3E-03	6.5E-04	N	--	--
Anthracene	120-12-7	6.01E+02	6.01E+03	0.12	4.6E+00	5.5E-01	2.3E+00	2.8E-01	Plant	5.3E+02	5.3E+03	2.3E-04	2.3E-05	N	--	--
Benzo(a)anthracene	56-55-3	3.64E-01	3.64E+00	0.39	5.4E-01	2.1E-01	1.1E+00	4.4E-01	Invertebrate	1.2E+00	1.2E+01	3.2E-01	3.2E-02	N	--	--
Benzo(a)anthracene	56-55-3	3.64E-01	3.64E+00	0.39	5.4E-01	2.1E-01	1.1E+00	4.4E-01	Invertebrate	1.2E+00	1.2E+01	3.2E-01	3.2E-02	N	--	--
Benzo(a)pyrene	50-32-8	1.19E+00	1.19E+01	0.3	3.3E+00	9.9E-01	1.2E+00	3.7E-01	Plant	1.4E+00	1.4E+01	2.1E-01	2.1E-02	N	--	--
Benzo(b)fluoranthene	205-99-2	1.19E+00	1.19E+01	0.57	4.8E-01	2.7E-01	2.3E+00	1.3E+00	Invertebrate	2.1E+00	2.1E+01	2.8E-01	2.8E-02	N	--	--
Benzo(g,h,i)perylene	191-24-2	5.95E-01	2.97E+00	0.14	1.6E+00	2.2E-01	3.5E+00	4.9E-01	Invertebrate	6.8E-01	3.4E+00	2.0E-01	4.1E-02	N	--	--
Benzo(k)fluoranthene	207-08-9	1.31E+01	1.31E+02	0.37	1.0E+00	3.7E-01	1.8E+00	6.5E-01	Invertebrate	2.9E+01	2.9E+02	1.3E-02	1.3E-03	N	--	--
Chrysene	218-01-9	1.80E+01	1.80E+02	0.68	1.1E+00	7.1E-01	1.6E+00	1.1E+00	Invertebrate	4.3E+01	4.3E+02	1.6E-02	1.6E-03	N	--	--
Dibenz(a,h)anthracene	53-70-3	2.43E+00	2.43E+01	0.11	2.3E-01	2.5E-02	2.0E+00	2.2E-01	Invertebrate	4.8E+00	4.8E+01	2.3E-02	2.3E-03	N	--	--
Fluoranthene	206-44-0	3.64E+01	1.82E+02	1.5	6.0E+00	9.0E+00	4.3E+00	6.5E+00	Plant	2.5E+01	1.2E+02	6.1E-02	1.2E-02	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	1.31E+01	1.31E+02	0.25	1.5E-01	3.8E-02	2.2E+00	5.5E-01	Invertebrate	2.3E+01	2.3E+02	1.1E-02	1.1E-03	N	--	--
Phenanthrene	85-01-8	8.32E+00	4.16E+01	0.55	1.1E+01	6.1E+00	1.1E+00	5.8E-01	Plant	3.1E+00	1.6E+01	1.8E-01	3.5E-02	N	--	--
Pyrene	129-00-0	9.51E+00	4.76E+01	0.81	3.7E+00	3.0E+00	3.7E+00	3.0E+00	Invertebrate	1.0E+01	5.1E+01	7.9E-02	1.6E-02	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Short-tailed Shrew Specific Data from Table F.2-9

BW=	0.0125	kg
IR_{food} =	0.003	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00039	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Screening Level

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Screening Level

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-17
Refined Wildlife Risk Characterization - Short-tailed Shrew
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment								
				Soil								
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics												
Arsenic	7440-38-2	1.50E-01	1.50E+00	25.61	3.8E-02	9.6E-01	9.31E-02	2.4E+00	5.2E+00	5.2E+01	**4.9E+00**	4.9E-01
Cadmium	7440-43-9	2.11E+00	2.11E+01	0.23	1.2E+00	2.8E-01	1.1E+01	2.6E+00	1.6E+00	1.6E+01	1.4E-01	1.4E-02
Chromium	7440-47-3	7.21E+00	7.21E+01	25.95	4.1E-02	1.1E+00	3.1E-01	7.9E+00	1.4E+02	1.4E+03	1.9E-01	1.9E-02
Lead	7439-92-1	1.76E+01	1.76E+02	53.99	4.6E-02	2.5E+00	3.7E-01	2.0E+01	2.9E+02	2.9E+03	1.9E-01	1.9E-02
Selenium	7782-49-2	4.40E-01	7.25E-01	1.657	5.4E-01	8.9E-01	8.1E-01	1.3E+00	3.7E+00	6.0E+00	4.5E-01	2.7E-01
Zinc	7440-66-6	3.52E+02	7.03E+02	75.97	7.0E-01	5.3E+01	4.7E+00	3.5E+02	6.2E+02	1.2E+03	1.2E-01	6.1E-02
Dioxin/Furans												
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.19E-06	1.19E-05	9.59E-06	6.5E-03	6.2E-08	1.1E+01	1.1E-04	9.3E-07	9.3E-06	**1.0E+01**	1.0E+00
Pesticides/PCBs												
Aroclor 1254	11097-69-1	8.09E-02	8.09E-01	0.523	6.8E-03	3.5E-03	6.7E+00	3.5E+00	1.0E-01	1.0E+00	**5.1E+00**	5.1E-01
Aroclor 1260	11096-82-5	8.09E-02	8.09E-01	0.0546	4.5E-03	2.5E-04	6.7E+00	3.6E-01	1.0E-01	1.0E+00	5.3E-01	5.3E-02

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

Short-tailed Shrew Specific Data from Table F.2-9

BW=	0.015	kg
IR_{food} =	0.002	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.14	unitless
DF_{inv} =	0.86	unitless
IR_{soil} =	0.00026	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-18
Preliminary Wildlife Risk Characterization - Red Fox
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																		
Arsenic	7440-38-2	3.59E-02	3.59E-01	55	1.1E+00	6.1E+01	5.2E-01	2.9E+01	1.5E-02	8.2E-01	Plant	2.7E-01	2.7E+00	**2.0E+02**	**2.0E+01**	**Y**	25.61	**9.3E+01**
Cadmium	7440-43-9	5.07E-01	5.07E+00	0.75	3.3E+00	2.4E+00	4.1E+01	3.1E+01	4.0E+00	3.0E+00	Invertebrate	1.1E-01	1.1E+00	**7.0E+00**	7.0E-01	**Y**	0.23	**2.1E+00**
Chromium	7440-47-3	1.73E+00	1.73E+01	37.6	8.4E-02	3.2E+00	3.2E+00	1.2E+02	3.3E-01	1.3E+01	Invertebrate	4.7E+00	4.7E+01	**8.0E+00**	8.0E-01	**Y**	25.95	**5.5E+00**
Copper	7440-50-8	8.02E+00	1.06E+01	76	6.3E-01	4.8E+01	1.5E+00	1.2E+02	1.0E+00	7.9E+01	Invertebrate	4.4E+01	5.8E+01	**1.7E+00**	**1.3E+00**	**Y**	39.1	8.8E-01
Lead	7439-92-1	4.22E+00	4.22E+01	110	4.7E-01	5.1E+01	1.5E+00	1.7E+02	2.9E-01	3.2E+01	Invertebrate	2.3E+01	2.3E+02	**4.7E+00**	4.7E-01	**Y**	53.99	**2.3E+00**
Mercury	7439-97-6	9.05E+00	9.05E+01	2.1	5.0E+00	1.1E+01	2.1E+01	4.3E+01	1.9E-01	4.0E-01	Invertebrate	3.8E+00	3.8E+01	5.6E-01	5.6E-02	N	--	--
Nickel	7440-02-0	2.11E+01	4.22E+01	20.9	1.4E+00	2.9E+01	4.7E+00	9.9E+01	5.9E-01	1.2E+01	Invertebrate	3.8E+01	7.6E+01	5.5E-01	2.7E-01	N	--	--
Selenium	7782-49-2	1.05E-01	1.74E-01	3.3	3.0E+00	9.9E+00	1.3E+00	4.4E+00	1.2E+00	3.9E+00	Plant	3.0E-01	4.9E-01	**1.1E+01**	**6.7E+00**	**Y**	1.657	**5.5E+00**
Silver	7440-22-4	1.17E+01	1.17E+02	0.2	3.7E-02	7.4E-03	1.5E+01	3.1E+00	5.0E-01	1.0E-01	Invertebrate	6.6E+00	6.6E+01	3.0E-02	3.0E-03	N	--	--
Zinc	7440-66-6	8.44E+01	1.69E+02	148	1.8E+00	2.7E+02	1.3E+01	1.9E+03	2.7E+00	4.0E+02	Invertebrate	5.6E+01	1.1E+02	**2.6E+00**	**1.3E+00**	**Y**	75.97	**1.3E+00**
Dioxin/Furans																		
Total 2,3,7,8-TCDD Equivalents	1746-01-6	2.85E-07	2.85E-06	7.1E-06	7.5E-03	5.4E-08	2.2E+01	1.6E-04	2.2E+00	1.6E-05	Invertebrate	1.1E-07	1.1E-06	**6.5E+01**	**6.5E+00**	**Y**	9.59E-06	**8.7E+01**
Pesticides/PCBs																		
4,4'-DDE	72-55-9	1.21E+01	1.21E+02	0.0018	8.0E-02	1.4E-04	2.0E+01	3.6E-02	1.0E+00	1.8E-03	Invertebrate	5.2E+00	5.2E+01	3.5E-04	3.5E-05	N	--	--
4,4'-DDT	50-29-3	4.22E-01	2.11E+00	0.0077	6.2E-01	4.8E-03	2.9E+01	2.3E-01	1.0E+00	7.7E-03	Invertebrate	1.2E-01	6.2E-01	6.2E-02	1.2E-02	N	--	--
Aldrin	309-00-2	1.05E-01	5.27E-01	0.0051	1.0E+00	5.1E-03	3.3E+00	1.7E-02	1.0E+00	5.1E-03	Invertebrate	2.7E-01	1.4E+00	1.9E-02	3.7E-03	N	--	--
alpha-Chlordane	5103-71-9	1.11E-01	1.11E+00	0.0032	1.0E+00	3.2E-03	4.0E+00	1.3E-02	1.0E+00	3.2E-03	Invertebrate	2.4E-01	2.4E+00	1.3E-02	1.3E-03	N	--	--
beta-BHC	319-85-7	2.11E-01	1.05E+00	0.012	1.0E+00	1.2E-02	1.9E+00	2.3E-02	1.0E+00	1.2E-02	Invertebrate	9.5E-01	4.7E+00	1.3E-02	2.5E-03	N	--	--
Endosulfan Sulfate	1031-07-8	1.37E-02	1.37E-01	0.029	1.0E+00	2.9E-02	2.2E+00	6.4E-02	1.0E+00	2.9E-02	Invertebrate	5.3E-02	5.3E-01	5.5E-01	5.5E-02	N	--	--
Endrin	72-20-8	2.62E-02	2.62E-01	0.0039	1.0E+00	3.9E-03	3.6E+00	1.4E-02	1.0E+00	3.9E-03	Invertebrate	6.2E-02	6.2E-01	6.3E-02	6.3E-03	N	--	--
Endrin Ketone	53494-70-5	2.62E-02	2.62E-01	0.024	1.0E+00	2.4E-02	3.6E+00	8.6E-02	1.0E+00	2.4E-02	Invertebrate	6.2E-02	6.2E-01	3.8E-01	3.8E-02	N	--	--
gamma-BHC (Lindane)	58-89-9	4.22E+00	4.22E+01	0.011	1.0E+00	1.1E-02	8.4E+00	9.2E-02	1.0E+00	1.1E-02	Invertebrate	4.3E+00	4.3E+01	2.6E-03	2.6E-04	N	--	--
gamma-Chlordane	5103-74-2	1.11E-01	1.11E+00	0.0076	1.0E+00	7.6E-03	4.0E+00	3.0E-02	1.0E+00	7.6E-03	Invertebrate	2.4E-01	2.4E+00	3.2E-02	3.2E-03	N	--	--
Methoxychlor	72-43-5	2.11E+00	4.22E+00	0.043	1.0E+00	4.3E-02	3.4E+00	1.5E-01	1.0E+00	4.3E-02	Invertebrate	5.3E+00	1.1E+01	8.2E-03	4.1E-03	N	--	--
Aroclor 1254	11097-69-1	1.94E-02	1.94E-01	2.1	6.8E-03	1.4E-02	1.6E+01	3.3E+01	1.0E+00	2.1E+00	Invertebrate	1.1E-02	1.1E-01	**2.0E+02**	**2.0E+01**	**Y**	0.523	**5.0E+01**
Aroclor 1260	11096-82-5	1.94E-02	1.94E-01	0.62	4.5E-03	2.8E-03	1.6E+01	9.9E+00	1.0E+00	6.2E-01	Invertebrate	1.1E-02	1.1E-01	**5.9E+01**	**5.9E+00**	**Y**	0.0546	**5.2E+00**
TCL PAHs																		
Acenaphthene	83-32-9	4.99E+00	2.50E+01	1.2	4.6E+00	5.5E+00	2.7E+00	3.3E+00	1.0E+00	1.2E+00	Plant	9.3E+00	4.7E+01	1.3E-01	2.6E-02	N	--	--
Acenaphthylene	208-96-8	5.27E+01	2.64E+02	0.22	4.6E+00	1.0E+00	1.3E+01	3.0E+00	1.0E+00	2.2E-01	Invertebrate	3.4E+01	1.7E+02	6.5E-03	1.3E-03	N	--	--
Anthracene	120-12-7	1.44E+02	1.44E+03	0.12	4.6E+00	5.5E-01	2.3E+00	2.8E-01	1.0E+00	1.2E-01	Plant	2.7E+02	2.7E+03	4.5E-04	4.5E-05	N	--	--
Benzo(a)anthracene	56-55-3	8.74E-02	8.74E-01	0.39	5.4E-01	2.1E-01	1.1E+00	4.4E-01	1.0E+00	3.9E-01	Invertebrate	6.6E-01	6.6E+00	5.9E-01	5.9E-02	N	--	--
Benzo(a)pyrene	50-32-8	2.85E-01	2.85E+00	0.3	3.3E+00	9.9E-01	1.2E+00	3.7E-01	1.0E+00	3.0E-01	Plant	7.4E-01	7.4E+00	4.1E-01	4.1E-02	N	--	--
Benzo(b)fluoranthene	205-99-2	2.85E-01	2.85E+00	0.57	4.8E-01	2.7E-01	2.3E+00	1.3E+00	1.0E+00	5.7E-01	Invertebrate	1.1E+00	1.1E+01	5.3E-01	5.3E-02	N	--	--
Benzo(g,h,i)perylene	191-24-2	1.43E-01	7.13E-01	0.14	1.6E+00	2.2E-01	3.5E+00	4.9E-01	1.0E+00	1.4E-01	Invertebrate	3.5E-01	1.7E+00	4.0E-01	8.0E-02	N	--	--
Benzo(k)fluoranthene	207-08-9	3.15E+00	3.15E+01	0.37	1.0E+00	3.7E-01	1.8E+00	6.5E-01	1.0E+00	3.7E-01	Invertebrate	1.5E+01	1.5E+02	2.4E-02	2.4E-03	N	--	--
Chrysene	218-01-9	4.32E+00	4.32E+01	0.68	1.1E+00	7.1E-01	1.6E+00	1.1E+00	1.0E+00	6.8E-01	Invertebrate	2.3E+01	2.3E+02	3.0E-02	3.0E-03	N	--	--
Dibenz(a,h)anthracene	53-70-3	5.82E-01	5.82E+00	0.11	2.3E-01	2.5E-02	2.0E+00	2.2E-01	1.0E+00	1.1E-01	Invertebrate	2.5E+00	2.5E+01	4.4E-02	4.4E-03	N	--	--
Fluoranthene	206-44-0	8.74E+00	4.37E+01	1.5	6.0E+00	9.0E+00	4.3E+00	6.5E+00	1.0E+00	1.5E+00	Plant	1.3E+01	6.3E+01	1.2E-01	2.4E-02	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	3.15E+00	3.15E+01	0.25	1.5E-01	3.8E-02	2.2E+00	5.5E-01	1.0E+00	2.5E-01	Invertebrate	1.2E+01	1.2E+02	2.1E-02	2.1E-03	N	--	--
Phenanthrene	85-01-8	2.00E+00	9.98E+00	0.55	1.1E+01	6.1E+00	1.1E+00	5.8E-01	1.0E+00	5.5E-01	Plant	1.6E+00	7.8E+00	3.5E-01	7.0E-02	N	--	--
Pyrene	129-00-0	2.28E+00	1.14E+01	0.81	3.7E+00	3.0E+00	3.7E+00	3.0E+00	1.0E+00	8.1E-01	Invertebrate	5.3E+00	2.6E+01	1.5E-01	3.1E-02	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Red FoxSpecific Data from Table F.2-9

BW=	2.9500	kg
IR_{food} =	0.342	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00960	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Screening Level

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Screening Level

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-19
Refined Wildlife Risk Characterization - Red Fox
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment										
				Soil										
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics														
Arsenic	7440-38-2	3.59E-02	3.59E-01	25.61	3.8E-02	9.6E-01	9.3E-02	2.4E+00	4.4E-03	1.1E-01	2.0E+03	2.0E+04	1.3E-02	1.3E-03
Cadmium	7440-43-9	5.07E-01	5.07E+00	0.23	1.2E+00	2.8E-01	1.1E+01	2.6E+00	6.2E-01	1.4E-01	9.8E+02	9.8E+03	2.3E-04	2.3E-05
Chromium	7440-47-3	1.73E+00	1.73E+01	25.95	4.1E-02	1.1E+00	3.1E-01	7.9E+00	9.8E-02	2.5E+00	3.1E+04	3.1E+05	8.2E-04	8.2E-05
Copper	7440-50-8	8.02E+00	1.06E+01	39.1	2.1E-01	8.3E+00	5.2E-01	2.0E+01	3.3E-01	1.3E+01	5.2E+04	6.9E+04	7.5E-04	5.7E-04
Lead	7439-92-1	4.22E+00	4.22E+01	53.99	4.6E-02	2.5E+00	3.7E-01	2.0E+01	1.2E-01	6.3E+00	6.7E+04	6.7E+05	8.1E-04	8.1E-05
Selenium	7782-49-2	1.05E-01	1.74E-01	1.657	5.4E-01	8.9E-01	8.1E-01	1.3E+00	4.8E-01	8.0E-01	4.5E+02	7.4E+02	3.7E-03	2.2E-03
Zinc	7440-66-6	8.44E+01	1.69E+02	75.97	7.0E-01	5.3E+01	4.7E+00	3.5E+02	1.4E+00	1.1E+02	1.3E+05	2.7E+05	5.7E-04	2.9E-04
Dioxin/Furans														
Total 2,3,7,8-TCDD Equivalents	1746-01-6	2.85E-07	2.85E-06	9.59E-06	6.5E-03	6.2E-08	1.1E+01	1.1E-04	7.2E-01	6.9E-06	6.2E-04	6.2E-03	1.5E-02	1.5E-03
Pesticides/PCBs														
Aroclor 1254	11097-69-1	1.94E-02	1.94E-01	0.523	6.8E-03	3.5E-03	6.7E+00	3.5E+00	1.0E+00	5.2E-01	4.0E+01	4.0E+02	1.3E-02	1.3E-03
Aroclor 1260	11096-82-5	1.94E-02	1.94E-01	0.0546	4.5E-03	2.5E-04	6.7E+00	3.6E-01	1.0E+00	5.5E-02	4.0E+01	4.0E+02	1.3E-03	1.3E-04

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

Red FoxSpecific Data from Table F.2-9

BW=	4.5300	kg
IR_{food} =	0.238	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.17	unitless
DF_{inv} =	0.04	unitless
DF_{mam} =	0.79	unitless
IR_{soil} =	0.00670	kg dw/day
AF =	0.0084	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-20
Preliminary Wildlife Risk Characterization - American Robin
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment												
				Soil												
				Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																
Arsenic	7440-38-2	5.14E+00	1.28E+01	55	1.1E+00	6.1E+01	5.2E-01	2.9E+01	Plant	1.4E+01	3.5E+01	**3.9E+00**	**1.6E+00**	**Y**	25.61	**1.8E+00**
Cadmium	7440-43-9	1.45E+00	2.00E+01	0.75	3.3E+00	2.4E+00	4.1E+01	3.1E+01	Invertebrate	1.1E-01	1.6E+00	**6.6E+00**	4.8E-01	**Y**	0.23	**2.0E+00**
Chromium	7440-47-3	1.00E+00	5.00E+00	37.6	8.4E-02	3.2E+00	3.2E+00	1.2E+02	Invertebrate	9.9E-01	4.9E+00	**3.8E+01**	**7.6E+00**	**Y**	25.95	**2.6E+01**
Copper	7440-50-8	4.70E+01	6.17E+01	76	6.3E-01	4.8E+01	1.5E+00	1.2E+02	Invertebrate	9.4E+01	1.2E+02	8.1E-01	6.1E-01	N	--	--
Lead	7439-92-1	1.13E+00	1.13E+01	110	4.7E-01	5.1E+01	1.5E+00	1.7E+02	Invertebrate	2.3E+00	2.3E+01	**4.8E+01**	**4.8E+00**	**Y**	53.99	**2.4E+01**
Mercury	7439-97-6	4.50E-01	9.00E-01	2.1	5.0E+00	1.1E+01	2.1E+01	4.3E+01	Invertebrate	6.9E-02	1.4E-01	**3.0E+01**	**1.5E+01**	**Y**	0.933	**1.4E+01**
Nickel	7440-02-0	7.74E+01	1.07E+02	20.9	1.4E+00	2.9E+01	4.7E+00	9.9E+01	Invertebrate	5.1E+01	7.1E+01	4.1E-01	2.9E-01	N	--	--
Selenium	7782-49-2	4.00E-01	8.00E-01	3.3	3.0E+00	9.9E+00	1.3E+00	4.4E+00	Plant	4.1E-01	8.3E-01	**8.0E+00**	**4.0E+00**	**Y**	1.657	**4.0E+00**
Silver	7440-22-4	1.66E+01	1.24E+02	0.2	3.7E-02	7.4E-03	1.5E+01	3.1E+00	Invertebrate	3.4E+00	2.6E+01	5.8E-02	7.8E-03	N	--	--
Zinc	7440-66-6	1.45E+01	1.31E+02	148	1.8E+00	2.7E+02	1.3E+01	1.9E+03	Invertebrate	3.6E+00	3.2E+01	**4.2E+01**	**4.6E+00**	**Y**	75.97	**2.1E+01**
Dioxin/Furans																
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	4.84E-06	7.5E-03	3.7E-08	2.2E+01	1.1E-04	Invertebrate	2.0E-06	2.0E-05	**2.4E+00**	2.4E-01	**Y**	1.16E-05	**5.8E+00**
Pesticides/PCBs																
4,4'-DDE	72-55-9	5.80E-02	5.80E-01	0.0018	8.0E-02	1.4E-04	2.0E+01	3.6E-02	Invertebrate	9.1E-03	9.1E-02	2.0E-01	2.0E-02	N	--	--
4,4'-DDT	50-29-3	2.80E-03	2.80E-02	0.0077	6.2E-01	4.8E-03	2.9E+01	2.3E-01	Invertebrate	3.0E-04	3.0E-03	**2.6E+01**	**2.6E+00**	**Y**	0.0077	**2.6E+01**
Aldrin	309-00-2	NV	NV	0.0051	--	--	--	--	--	--	--	**--**	**--**	N	--	--
alpha-Chlordane	5103-71-9	2.14E+00	1.07E+01	0.0032	1.0E+00	3.2E-03	4.0E+00	1.3E-02	Invertebrate	1.7E+00	8.4E+00	1.9E-03	3.8E-04	N	--	--
beta-BHC	319-85-7	5.60E-01	2.25E+00	0.012	1.0E+00	1.2E-02	1.9E+00	2.3E-02	Invertebrate	9.1E-01	3.7E+00	1.3E-02	3.3E-03	N	--	--
Endosulfan Sulfate	1031-07-8	1.00E+01	1.00E+02	0.029	1.0E+00	2.9E-02	2.2E+00	6.4E-02	Invertebrate	1.4E+01	1.4E+02	2.1E-03	2.1E-04	N	--	--
Endrin	72-20-8	2.80E-02	1.70E-01	0.0039	1.0E+00	3.9E-03	3.6E+00	1.4E-02	Invertebrate	2.4E-02	1.5E-01	1.6E-01	2.6E-02	N	--	--
Endrin Ketone	53494-70-5	2.80E-02	1.70E-01	0.024	1.0E+00	2.4E-02	3.6E+00	8.6E-02	Invertebrate	2.4E-02	1.5E-01	9.9E-01	1.6E-01	N	--	--
gamma-BHC (Lindane)	58-89-9	2.00E+00	2.00E+01	0.011	1.0E+00	1.1E-02	8.4E+00	9.2E-02	Invertebrate	7.5E-01	7.5E+00	1.5E-02	1.5E-03	N	--	--
gamma-Chlordane	5103-74-2	2.14E+00	1.06E+01	0.0076	1.0E+00	7.6E-03	4.0E+00	3.0E-02	Invertebrate	1.7E+00	8.3E+00	4.5E-03	9.1E-04	N	--	--
Methoxychlor	72-43-5	1.45E+01	1.45E+02	0.043	1.0E+00	4.3E-02	3.4E+00	1.5E-01	Invertebrate	1.3E+01	1.3E+02	3.2E-03	3.2E-04	N	--	--
Aroclor 1254	11097-69-1	4.10E-01	4.10E+00	2.1	6.8E-03	1.4E-02	1.6E+01	3.3E+01	Invertebrate	8.2E-02	8.2E-01	**2.6E+01**	**2.6E+00**	**Y**	0.523	**6.4E+00**
Aroclor 1260	11096-82-5	4.10E-01	4.10E+00	0.62	4.5E-03	2.8E-03	1.6E+01	9.9E+00	Invertebrate	8.2E-02	8.2E-01	**7.6E+00**	7.6E-01	**Y**	0.0546	6.7E-01
TCL PAHs																
Acenaphthene	83-32-9	1.01E+00	5.05E+00	1.2	4.6E+00	5.5E+00	2.7E+00	3.3E+00	Plant	6.9E-01	3.4E+00	**1.7E+00**	3.5E-01	**Y**	0.328	4.8E-01
Acenaphthylene	208-96-8	NV	NV	0.22	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Anthracene	120-12-7	NV	NV	0.12	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Benzo(a)anthracene	56-55-3	NV	NV	0.39	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Benzo(a)pyrene	50-32-8	5.00E-01	2.50E+00	0.3	3.3E+00	9.9E-01	1.2E+00	3.7E-01	Plant	4.7E-01	2.4E+00	6.3E-01	1.3E-01	N	--	--
Benzo(b)fluoranthene	205-99-2	NV	NV	0.57	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Benzo(g,h,i)perylene	191-24-2	NV	NV	0.14	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Benzo(k)fluoranthene	207-08-9	NV	NV	0.37	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Chrysene	218-01-9	NV	NV	0.68	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Dibenz(a,h)anthracene	53-70-3	NV	NV	0.11	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Fluoranthene	206-44-0	NV	NV	1.5	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	NV	NV	0.25	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.55	1.1E+01	6.1E+00	1.1E+00	5.8E-01	Plant	3.2E-01	1.6E+00	**1.7E+00**	3.4E-01	**Y**	0.146	4.5E-01
Pyrene	129-00-0	NV	NV	0.81	--	--	--	--	--	--	--	**--**	**--**	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

American Robin Specific Data from Table F.2-9

BW=	0.0635	kg
IR_{food} =	0.020	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00100	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-21
Refined Wildlife Risk Characterization - American Robin
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment								
				Soil								
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics												
Arsenic	7440-38-2	5.14E+00	1.28E+01	25.61	3.8E-02	9.6E-01	9.3E-02	2.4E+00	2.3E+02	5.7E+02	1.1E-01	4.5E-02
Cadmium	7440-43-9	1.45E+00	2.00E+01	0.23	1.2E+00	2.8E-01	1.1E+01	2.6E+00	1.4E+00	1.9E+01	1.7E-01	1.2E-02
Chromium	7440-47-3	1.00E+00	5.00E+00	25.95	4.1E-02	1.1E+00	3.1E-01	7.9E+00	2.5E+01	1.3E+02	1.0E+00	2.0E-01
Lead	7439-92-1	1.13E+00	1.13E+01	53.99	4.6E-02	2.5E+00	3.7E-01	2.0E+01	2.5E+01	2.5E+02	**2.2E+00**	2.2E-01
Mercury	7439-97-6	4.50E-01	9.00E-01	0.933	3.8E-01	3.6E-01	1.7E+00	1.6E+00	2.3E+00	4.7E+00	4.0E-01	2.0E-01
Selenium	7782-49-2	4.00E-01	8.00E-01	1.657	5.4E-01	8.9E-01	8.1E-01	1.3E+00	2.8E+00	5.6E+00	5.9E-01	3.0E-01
Zinc	7440-66-6	1.45E+01	1.31E+02	75.97	7.0E-01	5.3E+01	4.7E+00	3.5E+02	3.1E+01	2.8E+02	**2.4E+00**	2.7E-01
Dioxin/Furans												
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	1.16E-05	6.5E-03	7.6E-08	1.1E+01	1.3E-04	1.6E-05	1.6E-04	7.3E-01	7.3E-02
Pesticides/PCBs												
4,4'-DDT	50-29-3	2.80E-03	2.80E-02	0.0077	2.7E-01	2.1E-03	1.4E+01	1.1E-01	2.5E-03	2.5E-02	**3.1E+00**	3.1E-01
Aroclor 1254	11097-69-1	4.10E-01	4.10E+00	0.523	6.8E-03	3.5E-03	6.7E+00	3.5E+00	7.7E-01	7.7E+00	6.8E-01	6.8E-02
Aroclor 1260	11096-82-5	4.10E-01	4.10E+00	0.0546	4.5E-03	2.5E-04	6.7E+00	3.6E-01	7.7E-01	7.7E+00	7.1E-02	7.1E-03
TCL PAHs												
Acenaphthene	83-32-9	1.01E+00	5.05E+00	0.328	3.0E-02	1.0E-02	8.7E-01	2.8E-01	1.2E+01	6.1E+01	2.7E-02	5.4E-03
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.146	1.8E+00	2.6E-01	1.0E+00	1.5E-01	3.6E+00	1.8E+01	4.1E-02	8.2E-03

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10
BW = Average Body Weigth of Receptor (kg)
IR_{food} = Average Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor, specific to prey type and chemical
DF = Dietary fraction
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
BDL = Below Detection Limit
EPC = Exposure Point Concentration

American Robin Specific Data from Table F.2-9

BW=	0.0773	kg
IR_{food} =	0.016	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.62	unitless
DF_{inv} =	0.38	unitless
IR_{soil} =	0.0008	kg dw/day
AF =	1.000	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level
LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-22
Preliminary Wildlife Risk Characterization - Red-tailed Hawk
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics													
Arsenic	7440-38-2	5.14E+00	1.28E+01	55	1.5E-02	8.2E-01	5.2E+03	2.1E+03	1.0E-02	4.2E-03	N	--	--
Cadmium	7440-43-9	1.45E+00	2.00E+01	0.75	4.0E+00	3.0E+00	5.5E+00	4.0E-01	1.4E-01	9.9E-03	N	--	--
Chromium	7440-47-3	1.00E+00	5.00E+00	37.6	3.3E-01	1.3E+01	4.6E+01	9.1E+00	8.2E-01	1.6E-01	N	--	--
Copper	7440-50-8	4.70E+01	6.17E+01	76	1.0E+00	7.9E+01	6.8E+02	5.2E+02	1.1E-01	8.5E-02	N	--	--
Lead	7439-92-1	1.13E+00	1.13E+01	110	2.9E-01	3.2E+01	6.0E+01	6.0E+00	**1.8E+00**	1.8E-01	**Y**	53.99	9.0E-01
Mercury	7439-97-6	4.50E-01	9.00E-01	2.1	1.9E-01	4.0E-01	3.6E+01	1.8E+01	5.9E-02	2.9E-02	N	--	--
Nickel	7440-02-0	7.74E+01	1.07E+02	20.9	5.9E-01	1.2E+01	2.0E+03	1.4E+03	1.0E-02	7.6E-03	N	--	--
Selenium	7782-49-2	4.00E-01	8.00E-01	3.3	1.2E+00	3.9E+00	5.1E+00	2.6E+00	6.4E-01	3.2E-01	N	--	--
Silver	7440-22-4	1.66E+01	1.24E+02	0.2	5.0E-01	1.0E-01	5.0E+02	6.7E+01	4.0E-04	5.3E-05	N	--	--
Zinc	7440-66-6	1.45E+01	1.31E+02	148	2.7E+00	4.0E+02	8.2E+01	9.1E+00	**1.8E+00**	2.0E-01	**Y**	75.97	9.3E-01
Dioxin/Furans													
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	4.84E-06	2.2E+00	1.1E-05	9.7E-05	9.7E-06	5.0E-02	5.0E-03	N	--	--
Pesticides/PCBs													
4,4'-DDE	72-55-9	5.80E-02	5.80E-01	0.0018	1.0E+00	1.8E-03	8.8E-01	8.8E-02	2.0E-03	2.0E-04	N	--	--
4,4'-DDT	50-29-3	2.80E-03	2.80E-02	0.0077	1.0E+00	7.7E-03	4.3E-02	4.3E-03	1.8E-01	1.8E-02	N	--	--
Aldrin	309-00-2	NV	NV	0.0051	--	--	--	--	**--**	**--**	N	--	--
alpha-Chlordane	5103-71-9	2.14E+00	1.07E+01	0.0032	1.0E+00	3.2E-03	3.3E+01	6.5E+00	9.8E-05	2.0E-05	N	--	--
beta-BHC	319-85-7	5.60E-01	2.25E+00	0.012	1.0E+00	1.2E-02	8.5E+00	2.1E+00	1.4E-03	3.5E-04	N	--	--
Endosulfan Sulfate	1031-07-8	1.00E+01	1.00E+02	0.029	1.0E+00	2.9E-02	1.5E+02	1.5E+01	1.9E-04	1.9E-05	N	--	--
Endrin	72-20-8	2.80E-02	1.70E-01	0.0039	1.0E+00	3.9E-03	4.3E-01	7.0E-02	9.2E-03	1.5E-03	N	--	--
Endrin Ketone	53494-70-5	2.80E-02	1.70E-01	0.024	1.0E+00	2.4E-02	4.3E-01	7.0E-02	5.6E-02	9.3E-03	N	--	--
gamma-BHC (Lindane)	58-89-9	2.00E+00	2.00E+01	0.011	1.0E+00	1.1E-02	3.0E+01	3.0E+00	3.6E-04	3.6E-05	N	--	--
gamma-Chlordane	5103-74-2	2.14E+00	1.06E+01	0.0076	1.0E+00	7.6E-03	3.3E+01	6.6E+00	2.3E-04	4.7E-05	N	--	--
Methoxychlor	72-43-5	1.45E+01	1.45E+02	0.043	1.0E+00	4.3E-02	2.2E+02	2.2E+01	2.0E-04	2.0E-05	N	--	--
Aroclor 1254	11097-69-1	4.10E-01	4.10E+00	2.1	1.0E+00	2.1E+00	6.2E+00	6.2E-01	3.4E-01	3.4E-02	N	--	--
Aroclor 1260	11096-82-5	4.10E-01	4.10E+00	0.62	1.0E+00	6.2E-01	6.2E+00	6.2E-01	1.0E-01	1.0E-02	N	--	--
TCL PAHs													
Acenaphthene	83-32-9	1.01E+00	5.05E+00	1.2	1.0E+00	1.2E+00	1.5E+01	3.1E+00	7.8E-02	1.6E-02	N	--	--
Acenaphthylene	208-96-8	NV	NV	0.22	--	--	--	--	**--**	**--**	N	--	--
Anthracene	120-12-7	NV	NV	0.12	--	--	--	--	**--**	**--**	N	--	--
Benzo(a)anthracene	56-55-3	NV	NV	0.39	--	--	--	--	**--**	**--**	N	--	--
Benzo(a)pyrene	50-32-8	5.00E-01	2.50E+00	0.3	1.0E+00	3.0E-01	7.6E+00	1.5E+00	3.9E-02	7.9E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	NV	NV	0.57	--	--	--	--	**--**	**--**	N	--	--
Benzo(g,h,i)perylene	191-24-2	NV	NV	0.14	--	--	--	--	**--**	**--**	N	--	--
Benzo(k)fluoranthene	207-08-9	NV	NV	0.37	--	--	--	--	**--**	**--**	N	--	--
Chrysene	218-01-9	NV	NV	0.68	--	--	--	--	**--**	**--**	N	--	--
Dibenz(a,h)anthracene	53-70-3	NV	NV	0.11	--	--	--	--	**--**	**--**	N	--	--
Fluoranthene	206-44-0	NV	NV	1.5	--	--	--	--	**--**	**--**	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	NV	NV	0.25	--	--	--	--	**--**	**--**	N	--	--
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.55	1.0E+00	5.5E-01	1.7E+01	3.4E+00	3.2E-02	6.4E-03	N	--	--
Pyrene	129-00-0	NV	NV	0.81	--	--	--	--	**--**	**--**	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW_i = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Red-tailed Hawk Specific Data from Table F.2-9

BW=	0.957	kg
IR_{food} =	0.063	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{mam} =	1.00	unitless
IR_{soil} =	0.00	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screenning levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-23
Refined Wildlife Risk Characterization - Red-tailed Hawk
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment						
				Soil						
				EPC (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Soil Screening Level[a] (mg/kg)	Calculated LOAEL-Based Soil Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics										
Lead	7439-92-1	1.13E+00	1.13E+01	53.99	1.2E-01	6.3E+00	5.7E+04	5.7E+05	9.4E-04	9.4E-05
Zinc	7440-66-6	1.45E+01	1.31E+02	75.97	1.4E+00	1.1E+02	6.1E+04	5.5E+05	1.2E-03	1.4E-04

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Red-tailed Hawk Specific Data from Table F.2-9

BW=	1.134	kg
IR_{food} =	0.059	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{mam} =	1.00	unitless
IR_{soil} =	0.0	kg dw/day
AF =	0.0032	unitless

Table F.2-24
Wildlife Summary
Screening Level Ecological Risk Assessment - SWMU 40
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS#	Meadow Vole					Short-tailed Shrew					Red Fox					American Robin					Red-tailed Hawk				
		Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ
Inorganics																										
Arsenic	7440-38-2	**3.0E+02**	**3.0E+01**	**1.4E+02**	**2.8E+00**	2.8E-01	**1.1E+02**	**1.1E+01**	**5.1E+01**	**4.9E+00**	4.9E-01	**2.0E+02**	**2.0E+01**	**9.3E+01**	1.3E-02	1.3E-03	**3.9E+00**	**1.6E+00**	**1.8E+00**	1.1E-01	4.5E-02	1.0E-02	4.2E-03	NC	NC	NC
Cadmium	7440-43-9	8.6E-01	8.6E-02	NC	NC	NC	**3.5E+00**	3.5E-01	**1.1E+00**	1.4E-01	1.4E-02	**7.0E+00**	7.0E-01	**2.1E+00**	2.3E-04	2.3E-05	**6.6E+00**	4.8E-01	**2.0E+00**	1.7E-01	1.2E-02	1.4E-01	9.9E-03	NC	NC	NC
Chromium	7440-47-3	4.2E-01	4.2E-02	NC	NC	NC	**4.1E+00**	4.1E-01	**2.8E+00**	1.9E-01	1.9E-02	**8.0E+00**	8.0E-01	**5.5E+00**	8.2E-04	8.2E-05	**3.8E+01**	**7.6E+00**	**2.6E+01**	1.0E+00	2.0E-01	8.2E-01	1.6E-01	NC	NC	NC
Copper	7440-50-8	**1.1E+00**	8.3E-01	5.6E-01	7.5E-02	5.7E-02	9.1E-01	6.9E-01	NC	NC	NC	**1.7E+00**	**1.3E+00**	8.8E-01	7.5E-04	5.7E-04	8.1E-01	6.1E-01	NC	NC	NC	1.1E-01	8.5E-02	NC	NC	NC
Lead	7439-92-1	**2.3E+00**	2.3E-01	**1.1E+00**	5.8E-02	5.8E-03	**2.5E+00**	2.5E-01	**1.2E+00**	1.9E-01	1.9E-02	**4.7E+00**	4.7E-01	**2.3E+00**	8.1E-04	8.1E-05	**4.8E+01**	**4.8E+00**	**2.4E+01**	**2.2E+00**	2.2E-01	**1.8E+00**	1.8E-01	9.0E-01	9.4E-04	9.4E-05
Mercury	7439-97-6	2.1E-01	2.1E-02	NC	NC	NC	2.8E-01	2.8E-02	NC	NC	NC	5.6E-01	5.6E-02	NC	NC	NC	**3.0E+01**	**1.5E+01**	**1.4E+01**	4.0E-01	2.0E-01	5.9E-02	2.9E-02	NC	NC	NC
Nickel	7440-02-0	2.5E-01	1.3E-01	NC	NC	NC	2.8E-01	1.4E-01	NC	NC	NC	5.5E-01	2.7E-01	NC	NC	NC	4.1E-01	2.9E-01	NC	NC	NC	1.0E-02	7.6E-03	NC	NC	NC
Selenium	7782-49-2	**1.7E+01**	**1.0E+01**	**8.4E+00**	5.7E-01	3.5E-01	**5.7E+00**	**3.4E+00**	**2.8E+00**	4.5E-01	2.7E-01	**1.1E+01**	**6.7E+00**	**5.5E+00**	3.7E-03	2.2E-03	**8.0E+00**	**4.0E+00**	**4.0E+00**	5.9E-01	3.0E-01	6.4E-01	3.2E-01	NC	NC	NC
Silver	7440-22-4	1.8E-04	1.8E-05	NC	NC	NC	1.5E-02	1.5E-03	NC	NC	NC	3.0E-02	3.0E-03	NC	NC	NC	5.8E-02	7.8E-03	NC	NC	NC	4.0E-04	5.3E-05	NC	NC	NC
Zinc	7440-66-6	5.7E-01	2.9E-01	NC	NC	NC	**1.3E+00**	6.6E-01	6.7E-01	1.2E-01	6.1E-02	**2.6E+00**	**1.3E+00**	**1.3E+00**	5.7E-04	2.9E-04	**4.2E+01**	**4.6E+00**	**2.1E+01**	**2.4E+00**	2.7E-01	**1.8E+00**	2.0E-01	9.3E-01	1.2E-03	1.4E-04
Dioxin/Furans																										
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.4E-01	1.4E-02	NC	NC	NC	**3.2E+01**	**3.2E+00**	**4.3E+01**	**1.0E+01**	1.0E+00	**6.5E+01**	**6.5E+00**	**8.7E+01**	1.5E-02	1.5E-03	**2.4E+00**	2.4E-01	**5.8E+00**	7.3E-01	7.3E-02	5.0E-02	5.0E-03	NC	NC	NC
Pesticides/PCBs																										
4,4'-DDE	72-55-9	2.7E-06	2.7E-07	NC	NC	NC	1.7E-04	1.7E-05	NC	NC	NC	3.5E-04	3.5E-05	NC	NC	NC	2.0E-01	2.0E-02	NC	NC	NC	2.0E-03	2.0E-04	NC	NC	NC
4,4'-DDT	50-29-3	2.1E-03	4.2E-04	NC	NC	NC	3.1E-02	6.2E-03	NC	NC	NC	6.2E-02	1.2E-02	NC	NC	NC	**2.6E+01**	**2.6E+00**	**2.6E+01**	**3.1E+00**	3.1E-01	1.8E-01	1.8E-02	NC	NC	NC
Aldrin	309-00-2	8.8E-03	1.8E-03	NC	NC	NC	9.6E-03	1.9E-03	NC	NC	NC	1.9E-02	3.7E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
alpha-Chlordane	5103-71-9	5.2E-03	5.2E-04	NC	NC	NC	6.8E-03	6.8E-04	NC	NC	NC	1.3E-02	1.3E-03	NC	NC	NC	1.9E-03	3.8E-04	NC	NC	NC	9.8E-05	2.0E-05	NC	NC	NC
beta-BHC	319-85-7	1.0E-02	2.1E-03	NC	NC	NC	6.6E-03	1.3E-03	NC	NC	NC	1.3E-02	2.5E-03	NC	NC	NC	1.3E-02	3.3E-03	NC	NC	NC	1.4E-03	3.5E-04	NC	NC	NC
Endosulfan Sulfate	1031-07-8	3.8E-01	3.8E-02	NC	NC	NC	2.9E-01	2.9E-02	NC	NC	NC	5.5E-01	5.5E-02	NC	NC	NC	2.1E-03	2.1E-04	NC	NC	NC	1.9E-04	1.9E-05	NC	NC	NC
Endrin	72-20-8	2.7E-02	2.7E-03	NC	NC	NC	3.2E-02	3.2E-03	NC	NC	NC	6.3E-02	6.3E-03	NC	NC	NC	1.6E-01	2.6E-02	NC	NC	NC	9.2E-03	1.5E-03	NC	NC	NC
Endrin Ketone	53494-70-5	1.7E-01	1.7E-02	NC	NC	NC	2.0E-01	2.0E-02	NC	NC	NC	3.8E-01	3.8E-02	NC	NC	NC	9.9E-01	1.6E-01	NC	NC	NC	5.6E-02	9.3E-03	NC	NC	NC
gamma-BHC (Lindane)	58-89-9	4.7E-04	4.7E-05	NC	NC	NC	1.3E-03	1.3E-04	NC	NC	NC	2.6E-03	2.6E-04	NC	NC	NC	1.5E-02	1.5E-03	NC	NC	NC	3.6E-04	3.6E-05	NC	NC	NC
gamma-Chlordane	5103-74-2	1.2E-02	1.2E-03	NC	NC	NC	1.6E-02	1.6E-03	NC	NC	NC	3.2E-02	3.2E-03	NC	NC	NC	4.5E-03	9.1E-04	NC	NC	NC	2.3E-04	4.7E-05	NC	NC	NC
Methoxychlor	72-43-5	3.7E-03	1.8E-03	NC	NC	NC	4.2E-03	2.1E-03	NC	NC	NC	8.2E-03	4.1E-03	NC	NC	NC	3.2E-03	3.2E-04	NC	NC	NC	2.0E-04	2.0E-05	NC	NC	NC
Aroclor 1254	11097-69-1	5.9E-01	5.9E-02	NC	NC	NC	**1.0E+02**	**1.0E+01**	**2.5E+01**	**5.1E+00**	5.1E-01	**2.0E+02**	**2.0E+01**	**5.0E+01**	1.3E-02	1.3E-03	**2.6E+01**	**2.6E+00**	**6.4E+00**	6.8E-01	6.8E-02	3.4E-01	3.4E-02	NC	NC	NC
Aroclor 1260	11096-82-5	1.6E-01	1.6E-02	NC	NC	NC	**2.9E+01**	**2.9E+00**	**2.6E+00**	5.3E-01	5.3E-02	**5.9E+01**	**5.9E+00**	**5.2E+00**	1.3E-03	1.3E-04	**7.6E+00**	7.6E-01	6.7E-01	7.1E-02	7.1E-03	1.0E-01	1.0E-02	NC	NC	NC
TCL PAHs																										
Acenaphthene	83-32-9	2.0E-01	3.9E-02	NC	NC	NC	6.5E-02	1.3E-02	NC	NC	NC	1.3E-01	2.6E-02	NC	NC	NC	**1.7E+00**	3.5E-01	4.8E-01	2.7E-02	5.4E-03	7.8E-02	1.6E-02	NC	NC	NC
Acenaphthylene	208-96-8	3.4E-03	6.8E-04	NC	NC	NC	3.3E-03	6.5E-04	NC	NC	NC	6.5E-03	1.3E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Anthracene	120-12-7	6.8E-04	6.8E-05	NC	NC	NC	2.3E-04	2.3E-05	NC	NC	NC	4.5E-04	4.5E-05	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(a)anthracene	56-55-3	4.5E-01	4.5E-02	NC	NC	NC	3.2E-01	3.2E-02	NC	NC	NC	5.9E-01	5.9E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(a)pyrene	50-32-8	6.2E-01	6.2E-02	NC	NC	NC	2.1E-01	2.1E-02	NC	NC	NC	4.1E-01	4.1E-02	NC	NC	NC	6.3E-01	1.3E-01	NC	NC	NC	3.9E-02	7.9E-03	NC	NC	NC
Benzo(b)fluoranthene	205-99-2	1.8E-01	1.8E-02	NC	NC	NC	2.8E-01	2.8E-02	NC	NC	NC	5.3E-01	5.3E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(g,h,i)perylene	191-24-2	2.8E-01	5.6E-02	NC	NC	NC	2.0E-01	4.1E-02	NC	NC	NC	4.0E-01	8.0E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(k)fluoranthene	207-08-9	2.1E-02	2.1E-03	NC	NC	NC	1.3E-02	1.3E-03	NC	NC	NC	2.4E-02	2.4E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chrysene	218-01-9	3.0E-02	3.0E-03	NC	NC	NC	1.6E-02	1.6E-03	NC	NC	NC	3.0E-02	3.0E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Dibenz(a,h)anthracene	53-70-3	8.5E-03	8.5E-04	NC	NC	NC	2.3E-02	2.3E-03	NC	NC	NC	4.4E-02	4.4E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoranthene	206-44-0	1.8E-01	3.7E-02	NC	NC	NC	6.1E-02	1.2E-02	NC	NC	NC	1.2E-01	2.4E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Indeno(1,2,3-cd)pyrene	193-39-5	2.4E-03	2.4E-04	NC	NC	NC	1.1E-02	1.1E-03	NC	NC	NC	2.1E-02	2.1E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Phenanthrene	85-01-8	5.4E-01	1.1E-01	NC	NC	NC	1.8E-01	3.5E-02	NC	NC	NC	3.5E-01	7.0E-02	NC	NC	NC	**1.7E+00**	3.4E-01	4.5E-01	4.1E-02	8.2E-03	3.2E-02	6.4E-03	NC	NC	NC
Pyrene	129-00-0	2.3E-01	4.7E-02	NC	NC	NC	7.9E-02	1.6E-02	NC	NC	NC	1.5E-01	3.1E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
CAS = Chemical Abstract Services
NC = Not Calculated
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
HQ = Hazard Quotient
EPC = Exposure Point Concentration

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APPENDIX F.3

SWMU 71 SLERA

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Table F.3-1
SLERA Occurence/Distribution - SWMU 71 Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
TAL Metals (mg/kg)							
Aluminum	7429-90-5	3,460	33,000	mg/kg	71SB12A	7/7	1.6 - 79
Antimony	7440-36-0	0.2	16.4	mg/kg	71SS13	7/7	0.036 - 0.37
Arsenic	7440-38-2	4.7	16.1	mg/kg	71SS12 DUP AVG	7/7	0.023 - 0.35
Barium	7440-39-3	51.3	180	mg/kg	71SB16A	7/7	0.02 - 0.1
Beryllium	7440-41-7	0.29	1.6	mg/kg	71SB12A	7/7	0.01 - 0.02
Cadmium	7440-43-9	0.03	0.31	mg/kg	71SS12 DUP AVG	6/7	0.0073 - 0.04
Calcium	7440-70-2	2,610	172,000	mg/kg	71SS12 DUP AVG	7/7	0.96 - 10
Chromium	7440-47-3	11	47	mg/kg	71SB12A	7/7	0.06 - 0.57
Cobalt	7440-48-4	2.65	13	mg/kg	71SB12A	7/7	0.06 - 0.35
Copper	7440-50-8	15.8	40	mg/kg	71SB16A	7/7	0.022 - 0.17
Iron	7439-89-6	6,730	34,000	mg/kg	71SB12A	7/7	1.3 - 23
Lead	7439-92-1	9.9	366	mg/kg	71SS13	7/7	0.041 - 0.23
Magnesium	7439-95-4	1290	74,800	mg/kg	71SS11	7/7	0.61 - 170
Manganese	7439-96-5	83.7	550	mg/kg	71SB12A	7/7	0.02 - 0.14
Mercury	7439-97-6	0.019	0.49	mg/kg	71SB13A	7/7	0.0048 - 0.018
Nickel	7440-02-0	6.7	33	mg/kg	71SB12A	7/7	0.027 - 0.12
Potassium	7440-09-7	378	4,500	mg/kg	71SB12A	7/7	4.2 - 11.9
Selenium	7782-49-2	0.25	1.1	mg/kg	71SS13	5/7	0.063 - 0.35
Silver	7440-22-4	0.12	2.1	mg/kg	71SS12 DUP AVG	5/7	0.017 - 0.09
Sodium	7440-23-5	100	358	mg/kg	71SS13	6/7	19 - 35.2
Thallium	7440-28-0	0.35	0.59	mg/kg	71SB14A	3/6	0.0085 - 0.28
Vanadium	7440-62-2	11.6	91	mg/kg	71SB12A	7/7	0.024 - 0.08
Zinc	7440-66-6	24.5	152	mg/kg	71SS13	7/7	0.1 - 1.7
Pesticides/PCBs (ug/kg)							
Aldrin	309-00-2	8.6E-01	1.1E+00	µg/kg	71SS12 DUP AVG	2/4	0.17 - 0.17
beta-BHC	319-85-7	3.4E+00	5.5E+00	µg/kg	71SB11A	2/4	0.28 - 0.28
gamma-BHC (Lindane)	58-89-9	9.9E-01	9.9E-01	µg/kg	71SB11A	1/4	0.22 - 0.22
Aroclor 1254	11097-69-1	2.4E+01	4.6E+02	µg/kg	71SB13A	6/9	7.1 - 9
Aroclor 1260	11096-82-5	3.5E+01	9.2E+01	µg/kg	71SB13A	2/9	5.2 - 9.2
TCL VOCs (ug/kg)							
2-Butanone	78-93-3	1.7E+01	4.6E+01	µg/kg	71SB11A	3/4	1 - 4
4-Methyl-2-Pentanone	108-10-1	2.0E+00	1.6E+01	µg/kg	71SS12 DUP AVG	3/4	0.6 - 2
Acetone	67-64-1	5.4E+01	2.5E+02	µg/kg	71SB11A	4/4	1 - 3
Benzene	71-43-2	1.0E+00	3.2E+00	µg/kg	71SS12 DUP AVG	2/4	0.4 - 1
Bromomethane	74-83-9	2.0E+00	2.0E+00	µg/kg	71SS13	1/4	1 - 3
Carbon Disulfide	75-15-0	2.0E+00	7.5E+00	µg/kg	71SS12 DUP AVG	4/4	0.5 - 2
Cyclohexane	110-82-7	4.0E+00	4.0E+00	µg/kg	71SS12 DUP AVG	1/4	0.5 - 1
Dichlorodifluoromethane	75-71-8	1.0E+00	1.0E+00	µg/kg	71SB11A	1/4	0.5 - 1
Ethylbenzene	100-41-4	5.0E+00	5.0E+00	µg/kg	71SS12 DUP AVG	1/4	0.4 - 1
Methylcyclohexane	108-87-2	2.7E+01	2.7E+01	µg/kg	71SS12 DUP AVG	1/4	0.5 - 1
Methylene Chloride	75-09-2	6.0E+00	1.6E+01	µg/kg	71SS12 DUP AVG	2/4	0.5 - 2
Styrene	100-42-5	1.0E+00	1.0E+00	µg/kg	71SB11A	1/4	0.3 - 0.8
Toluene	108-88-3	1.0E+00	1.3E+01	µg/kg	71SS12 DUP AVG	4/4	0.4 - 1
Trichloroethene	79-01-6	1.0E+00	2.1E+01	µg/kg	71SS12 DUP AVG	4/4	0.4 - 1
Xylenes (Total)	1330-20-7	2.0E+00	6.1E+01	µg/kg	71SS12 DUP AVG	4/4	1 - 4
TCL SVOCs (ug/kg)							
2-Methylnaphthalene	91-57-6	3.3E+01	7.8E+01	µg/kg	71SS13	3/4	24 - 24
Bis(2-ethylhexyl)phthalate	117-81-7	4.7E+01	5.8E+01	µg/kg	71SS12 DUP AVG	3/4	32 - 32
TCL PAHs (ug/kg)							
Acenaphthene	83-32-9	1.2E+02	1.4E+02	µg/kg	71SS13	2/4	5.9 - 5.9
Acenaphthylene	208-96-8	1.2E+02	1.2E+02	µg/kg	71SS13	1/4	5.9 - 5.9
Benzo(a)anthracene	56-55-3	2.6E+01	3.6E+01	µg/kg	71SS13	2/4	2.2 - 2.2
Benzo(a)pyrene	50-32-8	5.4E+00	2.0E+01	µg/kg	71SS13	2/4	1.6 - 1.6
Benzo(b)fluoranthene	205-99-2	1.0E+01	1.5E+01	µg/kg	71SS13	2/4	1.7 - 1.7
Benzo(k)fluoranthene	207-08-9	7.9E+00	1.7E+01	µg/kg	71SS13	2/4	1.4 - 1.4
Chrysene	218-01-9	9.0E+00	5.4E+01	µg/kg	71SS13	2/4	2.4 - 2.4
Fluoranthene	206-44-0	3.1E+01	2.3E+02	µg/kg	71SS12 DUP AVG	4/4	2.1 - 2.1
Naphthalene	91-20-3	4.4E+01	1.2E+02	µg/kg	71SS13	2/4	14 - 14
Phenanthrene	85-01-8	6.7E+01	6.7E+01	µg/kg	71SS13	1/4	8.5 - 8.5
Pyrene	129-00-0	2.2E+01	2.2E+01	µg/kg	71SS12 DUP AVG	1/4	4.3 - 4.3
Dioxin/Furans (pg/g)							
2,3,7,8-TCDD TEQ (mammalian)	--	3.0E+00	3.6E+00	pg/g	71SS13	2/2	--
2,3,7,8-TCDD TEQ (avian)	--	2.7E+00	3.3E+00	pg/g	71SS13	2/2	--
DRO/GRO (mg/kg)							
DRO	--	4.9E+00	4.6E+01	mg/kg	71SB13A	3/3	0.99 - 1.1

Notes:

CAS = Chemical Abstracts Service
COPEC = Chemical of Potential Ecological Concern
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
mg/kg = Milligram Per Kilogram
µg/kg = Microgram Per Kilogram

Table F.3-2
Non-detected Chemicals MDL Screening for SWMU 71 - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
Gasoline Range Organics																		
GRO	--	mg/kg	3	3	0.95	1.1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
TAL Metals																		
Cadmium	7440-43-9	mg/kg	1	7	0.03	0.03	32	A	N	140	A	N	0.77	A	N	0.36	A	N
Selenium	7782-49-2	mg/kg	2	7	0.31	0.32	0.52	A	N	4.1	A	N	1.2	A	N	0.63	A	N
Silver	7440-22-4	mg/kg	2	7	0.08	0.09	560	A	N	50	E	N	4.2	A	N	14	A	N
Sodium	7440-23-5	mg/kg	1	7	19	19	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Thallium	7440-28-0	mg/kg	3	6	0.25	0.28	1	F	N	--	--	NS	--	--	NS	--	--	NS
Pesticides/PCBs																		
4,4'-DDD	72-54-8	ug/kg	4	4	0.32	0.32	100	G	N	100	C	N	--	--	NS	--	--	NS
4,4'-DDE	72-55-9	ug/kg	4	4	0.4	0.4	100	G	N	100	C	N	--	--	NS	--	--	NS
4,4'-DDT	50-29-3	ug/kg	4	4	0.39	0.39	100	G	N	100	C	N	93	A	N	21	A	N
Aldrin	309-00-2	ug/kg	2	4	0.17	0.17	100	G	N	100	C	N	--	--	NS	--	--	NS
alpha-BHC	319-84-6	ug/kg	4	4	0.26	0.26	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
alpha-Chlordane	5103-71-9	ug/kg	4	4	0.22	0.22	100	G	N	100	C	N	--	--	NS	--	--	NS
beta-BHC	319-85-7	ug/kg	2	4	0.28	0.28	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
delta-BHC	319-86-8	ug/kg	4	4	0.15	0.15	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
Dieldrin	60-57-1	ug/kg	4	4	0.43	0.43	100	G	N	100	C	N	22	A	N	4.9	A	N
Endosulfan I	959-98-8	ug/kg	4	4	0.43	0.43	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Endosulfan II	33213-65-9	ug/kg	4	4	0.58	0.58	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Endosulfan Sulfate	1031-07-8	ug/kg	4	4	0.4	0.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Endrin	72-20-8	ug/kg	4	4	0.35	0.35	100	G	N	100	C	N	--	--	NS	--	--	NS
Endrin Aldehyde	7421-93-4	ug/kg	4	4	0.35	0.35	100	G	N	100	C	N	--	--	NS	--	--	NS
Endrin Ketone	53494-70-5	ug/kg	4	4	0.39	0.39	100	G	N	100	C	N	--	--	NS	--	--	NS
gamma-BHC (Lindane)	58-89-9	ug/kg	3	4	0.22	0.22	100	G	N	100	C	N	--	--	NS	--	--	NS
gamma-Chlordane	5103-74-2	ug/kg	4	4	0.35	0.35	100	G	N	100	C	N	--	--	NS	--	--	NS
Heptachlor	76-44-8	ug/kg	4	4	0.34	0.34	100	G	N	100	C	N	--	--	NS	--	--	NS
Heptachlor Epoxide	1024-57-3	ug/kg	4	4	0.26	0.26	100	G	N	100	C	N	--	--	NS	--	--	NS
Methoxychlor	72-43-5	ug/kg	4	4	1.4	1.4	100	G	N	100	C	N	--	--	NS	--	--	NS
Toxaphene	8001-35-2	ug/kg	4	4	18	18	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Aroclor 1016	12674-11-2	ug/kg	7	7	5.1	15	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1221	11104-28-2	ug/kg	7	7	14	16	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1232	11141-16-5	ug/kg	7	7	5.3	6	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1242	53469-21-9	ug/kg	7	7	7.3	10	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1248	12672-29-6	ug/kg	6	7	4.4	9.1	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1254	11097-69-1	ug/kg	1	7	8	8	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1260	11096-82-5	ug/kg	5	7	5.2	9.2	40,000	--	N	--	--	NS	--	--	NS	--	--	NS
TCL VOCs																		
1,1,1-Trichloroethane	71-55-6	ug/kg	4	4	0.5	2	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1,2,2-Tetrachloroethane	79-34-5	ug/kg	4	4	0.2	0.5	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/kg	4	4	6	18	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,1,2-Trichloroethane	79-00-5	ug/kg	4	4	0.2	0.5	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1-Dichloroethane	75-34-3	ug/kg	4	4	0.3	1	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1-Dichloroethene	75-35-4	ug/kg	4	4	0.7	2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,4-Trichlorobenzene	120-82-1	ug/kg	4	4	0.4	1	100	G	N	100	C	N	--	--	NS	--	--	NS
1,2-Dibromo-3-chloropropane	96-12-8	ug/kg	4	4	0.3	0.8	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2-Dibromoethane	106-93-4	ug/kg	4	4	0.2	0.6	--	--	NS	5,000	C	N	--	--	NS	--	--	NS
1,2-Dichlorobenzene	95-50-1	ug/kg	4	4	0.2	0.5	100	G	N	100	C	N	--	--	NS	--	--	NS
1,2-Dichloroethane	107-06-2	ug/kg	4	4	0.3	1	870,000	G	N	--	--	NS	--	--	NS	--	--	NS
1,2-Dichloropropane	78-87-5	ug/kg	4	4	0.2	0.6	300	G	N	300	C	N	--	--	NS	--	--	NS
1,3-Dichlorobenzene	541-73-1	ug/kg	4	4	0.3	0.8	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,4-Dichlorobenzene	106-46-7	ug/kg	4	4	0.3	0.7	100	G	N	20,000	B	N	--	--	NS	--	--	NS
2-Butanone	78-93-3	ug/kg	1	4	1	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Hexanone	591-78-6	ug/kg	4	4	0.6	2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Methyl-2-Pentanone	108-10-1	ug/kg	1	4	0.6	0.6	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
Benzene	71-43-2	ug/kg	2	4	0.4	0.6	100	G	N	100	C	N	--	--	NS	--	--	NS
Bromodichloromethane	75-27-4	ug/kg	4	4	0.2	0.6	450,000	G	N	--	--	NS	--	--	NS	--	--	NS

Table F.3-2
Non-detected Chemicals MDL Screening for SWMU 71 - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
Bromoform	75-25-2	ug/kg	4	4	0.3	0.8	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Bromomethane	74-83-9	ug/kg	3	4	1	3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Carbon Tetrachloride	56-23-5	ug/kg	4	4	0.5	2	300	G	N	300	C	N	--	--	NS	--	--	NS
Chlorobenzene	108-90-7	ug/kg	4	4	0.3	0.7	100	G	N	40,000	B	N	--	--	NS	--	--	NS
Chloroethane	75-00-3	ug/kg	4	4	0.5	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Chloroform	67-66-3	ug/kg	4	4	0.4	1	300	G	N	300	C	N	--	--	NS	--	--	NS
Chloromethane	74-87-3	ug/kg	4	4	1	3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
cis-1,2-Dichloroethene	156-59-2	ug/kg	4	4	0.4	1	300	G	N	300	C	N	--	--	NS	--	--	NS
cis-1,3-Dichloropropene	10061-01-5	ug/kg	4	4	0.3	0.9	300	G	N	300	C	N	--	--	NS	--	--	NS
Cyclohexane	110-82-7	ug/kg	3	4	0.5	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dibromochloromethane	124-48-1	ug/kg	4	4	0.2	0.5	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dichlorodifluoromethane	75-71-8	ug/kg	3	4	0.5	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Ethylbenzene	100-41-4	ug/kg	3	4	0.4	0.8	100	G	N	100	C	N	--	--	NS	--	--	NS
Isopropylbenzene	98-82-8	ug/kg	4	4	6	18	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Methyl Acetate	79-20-9	ug/kg	4	4	0.6	2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Methyl-t-butyl Ether	1634-04-4	ug/kg	4	4	6	18	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Methylcyclohexane	108-87-2	ug/kg	3	4	0.5	0.9	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Methylene Chloride	75-09-2	ug/kg	2	4	0.5	0.7	300	G	N	300	C	N	--	--	NS	--	--	NS
Styrene	100-42-5	ug/kg	3	4	0.3	0.8	300,000	F	N	100	C	N	--	--	NS	--	--	NS
Tetrachloroethene	127-18-4	ug/kg	4	4	0.4	1	300	G	N	300	C	N	--	--	NS	--	--	NS
trans-1,2-Dichloroethene	156-60-5	ug/kg	4	4	0.4	1	300	G	N	300	C	N	--	--	NS	--	--	NS
trans-1,3-Dichloropropene	10061-02-6	ug/kg	4	4	0.2	0.7	300	G	N	300	C	N	--	--	NS	--	--	NS
Trichlorofluoromethane	75-69-4	ug/kg	4	4	0.6	2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Vinyl Chloride	75-01-4	ug/kg	4	4	0.5	1	300	G	N	300	C	N	--	--	NS	--	--	NS
TCL SVOCs																		
1,1'-Biphenyl	92-52-4	ug/kg	4	4	22	22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,2'-oxybis(1-chloropropane)	108-60-1	ug/kg	4	4	30	30	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,5-Trichlorophenol	95-95-4	ug/kg	4	4	49	49	4,000	F	N	9,000	B	N	--	--	NS	--	--	NS
2,4,6-Trichlorophenol	88-06-2	ug/kg	4	4	50	50	100	G	N	10,000	B	N	--	--	NS	--	--	NS
2,4-Dichlorophenol	120-83-2	ug/kg	4	4	22	22	100	G	N	100	C	N	--	--	NS	--	--	NS
2,4-Dimethylphenol	105-67-9	ug/kg	4	4	30	30	100	G	N	100	C	N	--	--	NS	--	--	NS
2,4-Dinitrophenol	51-28-5	ug/kg	4	4	170	170	20,000	F	N	100	C	**Y**	--	--	NS	--	--	NS
2,4-Dinitrotoluene	121-14-2	ug/kg	4	4	20	20	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,6-Dinitrotoluene	606-20-2	ug/kg	4	4	21	21	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Chloronaphthalene	91-58-7	ug/kg	4	4	22	22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Chlorophenol	95-57-8	ug/kg	4	4	18	18	7,000	F	N	10,000	B	N	--	--	NS	--	--	NS
2-Methylnaphthalene	91-57-6	ug/kg	1	4	24	24	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Methylphenol	95-48-7	ug/kg	4	4	27	27	100	G	N	100	C	N	--	--	NS	--	--	NS
2-Nitroaniline	88-74-4	ug/kg	4	4	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Nitrophenol	88-75-5	ug/kg	4	4	26	26	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3,3'-Dichlorobenzidine	91-94-1	ug/kg	4	4	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3-Nitroaniline	99-09-2	ug/kg	4	4	34	34	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4,6-Dinitro-2-Methylphenol	534-52-1	ug/kg	4	4	35	35	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Bromophenyl Phenyl Ether	101-55-3	ug/kg	4	4	350	380	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Chloro-3-Methylphenol	59-50-7	ug/kg	4	4	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Chloroaniline	106-47-8	ug/kg	4	4	16	16	20,000	F	N	--	--	NS	--	--	NS	--	--	NS
4-Chlorophenyl Phenyl Ether	7005-72-3	ug/kg	4	4	350	380	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Methylphenol	106-44-5	ug/kg	4	4	48	48	100	G	N	100	C	N	--	--	NS	--	--	NS
4-Nitroaniline	100-01-6	ug/kg	4	4	39	39	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Nitrophenol	100-02-7	ug/kg	4	4	75	75	100	G	N	7,000	B	N	--	--	NS	--	--	NS
Acenaphthene	83-32-9	ug/kg	4	4	31	31	100	G	N	100	C	N	--	--	NS	--	--	NS
Acenaphthylene	208-96-8	ug/kg	4	4	17	17	100	G	N	100	C	N	--	--	NS	--	--	NS
Acetophenone	98-86-2	ug/kg	4	4	23	23	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Anthracene	120-12-7	ug/kg	4	4	25	25	100	G	N	100	C	N	--	--	NS	--	--	NS
Atrazine	1912-24-9	ug/kg	4	4	16	16	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Benzaldehyde	100-52-7	ug/kg	4	4	39	39	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Benzo(a)anthracene	50-32-8	ug/kg	4	4	29	29	100	G	N	--	--	NS	--	--	NS	--	--	NS

Table F.3-2
Non-detected Chemicals MDL Screening for SWMU 71 - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
Benzo(a)pyrene	56-55-3	ug/kg	4	4	23	23	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(b)fluoranthene	205-99-2	ug/kg	4	4	36	36	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(g,h,i)perylene	191-24-2	ug/kg	4	4	23	23	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(k)fluoranthene	207-08-9	ug/kg	4	4	29	29	100	G	N	100	C	N	--	--	NS	--	--	NS
bis(2-Chloroethoxy)methane	111-91-1	ug/kg	4	4	21	21	--	--	NS	--	--	NS	--	--	NS	--	--	NS
bis(2-Chloroethyl)ether	111-44-4	ug/kg	4	4	18	18	--	--	NS	--	--	NS	--	--	NS	--	--	NS
bis(2-ethylhexyl)phthalate	117-81-7	ug/kg	1	4	32	32	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Butylbenzylphthalate	85-68-7	ug/kg	4	4	350	380	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Caprolactam	105-60-2	ug/kg	4	4	62	62	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Carbazole	86-74-8	ug/kg	4	4	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Chrysene	218-01-9	ug/kg	4	4	28	28	100	G	N	100	C	N	--	--	NS	--	--	NS
Di-n-butylphthalate	84-74-2	ug/kg	4	4	350	380	200,000	F	N	--	--	NS	--	--	NS	--	--	NS
Di-n-octylphthalate	117-84-0	ug/kg	4	4	350	380	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dibenzo(a,h)anthracene	53-70-3	ug/kg	4	4	21	21	100	G	N	100	C	N	--	--	NS	--	--	NS
Dibenzofuran	132-64-9	ug/kg	4	4	24	24	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Diethylphthalate	84-66-2	ug/kg	4	4	350	380	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dimethylphthalate	131-11-3	ug/kg	4	4	350	380	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Fluoranthene	206-44-0	ug/kg	1	4	18	18	100	G	N	100	C	N	--	--	NS	--	--	NS
Fluorene	86-73-7	ug/kg	4	4	18	18	100	G	N	100	C	N	--	--	NS	--	--	NS
Hexachlorobenzene	118-74-1	ug/kg	4	4	22	22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Hexachlorobutadiene	87-68-3	ug/kg	4	4	24	24	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Hexachlorocyclopentadiene	77-47-4	ug/kg	4	4	67	67	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Hexachloroethane	67-72-1	ug/kg	4	4	17	17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	4	4	20	20	100	G	N	100	C	N	--	--	NS	--	--	NS
Isophorone	78-59-1	ug/kg	4	4	28	28	--	--	NS	--	--	NS	--	--	NS	--	--	NS
n-Nitroso-di-n-Propylamine	621-64-7	ug/kg	4	4	21	21	--	--	NS	--	--	NS	--	--	NS	--	--	NS
n-Nitrosodiphenylamine	86-30-6	ug/kg	4	4	350	770	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Naphthalene	91-20-3	ug/kg	3	4	21	21	100	G	N	100	C	N	--	--	NS	--	--	NS
Nitrobenzene	98-95-3	ug/kg	4	4	28	28	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Pentachlorophenol	87-86-5	ug/kg	4	4	46	46	5,000	A	N	31,000	A	N	2,100	A	N	2,800	A	N
Phenanthrene	85-01-8	ug/kg	1	4	24	24	100	G	N	100	C	N	--	--	NS	--	--	NS
Phenol	108-95-2	ug/kg	4	4	34	34	100	G	N	30,000	B	N	--	--	NS	--	--	NS
Pyrene	129-00-0	ug/kg	2	4	24	24	100	G	N	100	C	N	--	--	NS	--	--	NS
Dioxin/Furans																		
1,2,3,4,7,8,9-HpCDF	55673-89-7	pg/g	2	2	0.4	0.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,6,7,8-HxCDF	57117-44-9	pg/g	1	2	0.3	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8,9-HxCDF	72918-21-9	pg/g	2	2	0.2	0.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8-PeCDF	57117-41-6	pg/g	1	2	0.1	0.1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,7,8-TCDD	1746-01-6	pg/g	1	2	0.3	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
PAHs																		
Acenaphthene	83-32-9	ug/kg	2	4	5.9	5.9	100	G	N	100	C	N	--	--	NS	--	--	NS
Acenaphthylene	208-96-8	ug/kg	3	4	5.9	5.9	100	G	N	100	C	N	--	--	NS	--	--	NS
Anthracene	120-12-7	ug/kg	4	4	5.4	5.4	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(a)anthracene	50-32-8	ug/kg	2	4	2.2	2.2	100	G	N	--	--	NS	--	--	NS	--	--	NS
Benzo(a)pyrene	56-55-3	ug/kg	2	4	1.6	1.6	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(b)fluoranthene	205-99-2	ug/kg	2	4	1.7	1.7	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(g,h,i)perylene	207-08-9	ug/kg	4	4	3.6	3.6	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(k)fluoranthene	191-24-2	ug/kg	2	4	1.4	1.4	100	G	N	100	C	N	--	--	NS	--	--	NS
Chrysene	218-01-9	ug/kg	2	4	2.4	2.4	100	G	N	100	C	N	--	--	NS	--	--	NS
Dibenzo(a,h)anthracene	53-70-3	ug/kg	4	4	4.2	4.2	100	G	N	100	C	N	--	--	NS	--	--	NS
Fluorene	86-73-7	ug/kg	4	4	14	14	100	G	N	100	C	N	--	--	NS	--	--	NS
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	4	4	2.5	2.5	100	G	N	100	C	N	--	--	NS	--	--	NS
Naphthalene	91-20-3	ug/kg	2	4	14	14	100	G	N	100	C	N	--	--	NS	--	--	NS
Phenanthrene	85-01-8	ug/kg	3	4	8.5	8.5	100	G	N	100	C	N	--	--	NS	--	--	NS
Pyrene	129-00-0	ug/kg	3	4	4.3	4.3	100	G	N	100	C	N	--	--	NS	--	--	NS
Explosives																		
1,3,5-Trinitrobenzene	99-35-4	mg/kg	4	4	0.079	0.079	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Table F.3-2
Non-detected Chemicals MDL Screening for SWMU 71 - Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
1,3-Dinitrobenzene	99-65-0	mg/kg	4	4	0.097	0.097	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,6-Trinitrotoluene	118-96-7	mg/kg	4	4	0.16	0.16	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4-Dinitrotoluene	121-14-2	mg/kg	4	4	0.12	0.12	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,6-Dinitrotoluene	606-20-2	mg/kg	4	4	0.19	0.19	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Amino-4,6-Dinitrotoluene	35572-78-2	mg/kg	4	4	0.1	0.1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Nitrotoluene	88-72-2	mg/kg	4	4	0.16	0.16	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3-Nitrotoluene	99-08-1	mg/kg	4	4	0.11	0.11	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Amino-2,6-Dinitrotoluene	1946-51-0	mg/kg	4	4	0.095	0.095	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Nitrotoluene	99-99-0	mg/kg	4	4	0.27	0.27	--	--	NS	--	--	NS	--	--	NS	--	--	NS
HMX	2691-41-0	mg/kg	4	4	0.1	0.1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Nitrobenzene	98-95-3	mg/kg	4	4	0.17	0.17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
RDX	121-82-4	mg/kg	4	4	0.28	0.28	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Tetryl	479-45-8	mg/kg	4	4	0.4	0.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Nitroglycerin																		
Nitroglycerin	55-63-0	mg/kg	4	4	1	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
SL = Screening Level
Eco SSL = Ecological Soil Screening Level

Sources:
A = USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
B = ORNL - Earthworms - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
C = BTAG - Fauna - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
E = ORNL - Microbial Processes - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
F = ORNL - Plants - Toxilogical Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision Efroymson et al.)
G = BTAG - Flora - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available

Table F.3-3a
Dioxin/Furan Equivalent Calculation - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	CAS #	Mammalian TEF	Avian TEF	71SS11 11/11/2002 0-1		71SS13 11/11/2002 0-1	
				Result	LQ, VQ, r	Result	LQ, VQ, r
Dioxin/Furans (pg/g)							
1,2,3,4,6,7,8,9-OCDD (OCDD)	3268-87-9	0.0003	0.0001	438		1,050	
1,2,3,4,6,7,8,9-OCDF (OCDD)	39001-02-0	0.0003	0.0001	9.8	J	35.5	
1,2,3,4,6,7,8-HpCDD	35822-39-4	0.01	0.001	53.6		89.9	
1,2,3,4,6,7,8-HpCDF	67562-39-4	0.01	0.01	5.4		10.3	
1,2,3,4,7,8,9-HpCDF	55673-89-7	0.01	0.01	<5		<5	
1,2,3,4,7,8-HxCDD	39227-28-6	0.1	0.05	1.2	J	1.5	J
1,2,3,4,7,8-HxCDF	70648-26-9	0.1	0.1	1.3	J	2.3	J
1,2,3,6,7,8-HxCDD	57653-85-7	0.1	0.01	2.3	J	3	J
1,2,3,6,7,8-HxCDF	57117-44-9	0.1	0.1	<5		0.96	J
1,2,3,7,8,9-HxCDD	19408-74-3	0.1	0.1	3.6	J	3.4	J
1,2,3,7,8,9-HxCDF	72918-21-9	0.1	0.1	<5		<5	
1,2,3,7,8-PeCDD	40321-76-4	1	1	1.1	J	0.74	J
1,2,3,7,8-PeCDF	57117-41-6	0.03	0.1	1.7	MXJ,J,w	<5	
2,3,4,6,7,8-HxCDF	60851-34-5	0.1	0.1	0.6	J	0.99	J
2,3,4,7,8-PeCDF	57117-31-4	0.3	1	0.64	J	0.76	J,J,l
2,3,7,8-TCDD	1746-01-6	1	1	<1		0.37	JB,B,z
2,3,7,8-TCDF	51207-31-9	0.1	1	0.69	J	0.66	J
Total 2,3,7,8-TCDD Equivalents (Mammalian)				3.036		3.577	
Total 2,3,7,8-TCDD Equivalents (Avian)				2.745		3.331	

Notes:

pg/g = Picogram Per Gram
ft bgs = Feet Below Ground Surface
TEF = Toxicity Equivalency Factor
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code

Total 2,3,7,8-TCDD Equivalents are calculated by summing the detected concentration times the TEF for each chemical. Non-detects, R-flagged data, and B-flagged data are excluded from summed total.

Qualifiers:

B	Not detected substantially above the level reported in laboratory or field blanks.
J	Analyte present. Reported value may not be accurate or precise.
U	The compound was analyzed for but not detected. The reporting limit will be adjusted to reflect any dilution, and for soil, the percent moisture.
X	Associated PCDF peak(s) has the same retention time as the associated diphenyl ether and the diphenyl ether contribution is greater than 10%.
l	LCS recovery failure.
w	Retention time failure.
z	Method blank contamination.

Table F.3-3b
Summary of Low and High Molecular Weight PAHs - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	CAS #	71SS11 11/11/2002 0-1		71SS12 DUP AVG 1/11/2002 0-1		71SS13 11/18/2002 0-1		71SB11A 11/11/2002 0-1	
		Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
TCL PAHs (ug/kg)									
Acenaphthene	83-32-9	<46	U	121.5	Z	140	P,J,g	<48	U
Acenaphthylene	208-96-8	<46	U	<49	U	120	P,J,g	<48	U
Naphthalene	91-20-3	<46	U	44	JZ	120	P,J,g	<48	U
Phenanthrene	85-01-8	<46	U	<49	U	67		<48	U
Low Molecular Weight PAHs	--	ND		166		447		ND	
Benzo(a)anthracene	56-55-3	<9	U	25.7	PZ,J,g	36	P,J,g	<9.4	U
Benzo(a)pyrene	50-32-8	<9	U	5.4	JPZ,J,g	20		<9.4	U
Benzo(b)fluoranthene	205-99-2	<9	U	10.425	P,J,g	15	J,c	<9.4	U
Benzo(k)fluoranthene	207-08-9	<9	U	7.85		17	P,J,c	<9.4	U
Chrysene	218-01-9	9	JP,J,g	<9.6	U	54	P,J,c	<9.4	U
Dibenz(a,h)anthracene	53-70-3	<9	U	<9.6	U	<8.8	U	<9.4	U
Fluoranthene	206-44-0	31		234.5	PZ,J,c	82		44	
Pyrene	129-00-0	<18	U	21.5	JZ	<18	U	<19	U
High Molecular Weight PAHs	--	40		471		738		44	

Notes:
CAS = Chemical Abstract Service
ug/kg = Microgram per kilogram
ND = Not Detected
TAL = Target Analyte List
PAH = Polynuclear Aromatic Hydrocarbon
See Table 4-1 for flag definitions

Table F.3-3c
Summary of Total PCBs - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	CAS #	71SS11 11/11/2002 0-1		71SS12 DUP AVG 1/11/2002 0-1		71SS13 11/18/2002 0-1		71SB11A 11/11/2002 0-1		71SB12A 4/20/2006 0-1		71SB13A 4/20/2006 0-1		71SB16A 4/21/2006 0-1	
		Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
Pesticides/PCBs (ug/kg)															
Aroclor 1016	12674-11-2	<71	U	<15	U	<69	U	<74	U	<88	U	<80	U	<78	U
Aroclor 1248	12672-29-6	<49	U	<52	U	<48	U	<51	U	<44	U	450	,J,g	<39	U
Aroclor 1254	11097-69-1	24	J	107		83	P,J,g	34	JP,J,g	<44	U	460	,J,g	150	
Aroclor 1260	11096-82-5	<71	U	<76	U	35	J	<74	U	<88	U	92		<78	U
Total PCBs	--	24		107		118		34		ND		1,002		150	

Notes:
CAS = Chemical Abstract Service
ug/kg = Microgram per kilogram
ND = Not Detected
PBC = PolyChlorinated Biphenyl
See Table 4-1 for flag definitions

Table F.3-4
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Exposure to Contaminants in SWMU 71 Surface Soil
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Surface Soil	Aluminum	mg/kg	10,456	21,642	33,000	21,642	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Antimony	mg/kg	2.834	11.94	16.4	11.94	mg/kg	99% Chebyshev (MVUE) UCL	ProUCL 4.0
	Arsenic	mg/kg	10.41	14.24	16.1	14.24	mg/kg	95% Student's t UCL	ProUCL 4.0
	Cadmium	mg/kg	0.155	0.217	0.31	0.217	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Calcium	mg/kg	77,373	255,378	172,000	172,000	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Chromium	mg/kg	21.16	30.95	47	30.95	mg/kg	95% Student's t UCL	ProUCL 4.0
	Iron	mg/kg	15,416	25,860	34,000	25,860	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Lead	mg/kg	80.45	241.3	366	241.3	mg/kg	95% H-UCL	ProUCL 4.0
	Manganese	mg/kg	204.2	461.3	550	461.3	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Mercury	mg/kg	0.167	0.289	0.49	0.289	mg/kg	95% Student's t UCL	ProUCL 4.0
	Selenium	mg/kg	0.638	0.764	1.1	0.764	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Vanadium	mg/kg	27.94	54.94	91	54.94	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Zinc	mg/kg	69.16	106.4	152	106.4	mg/kg	95% Student's t UCL	ProUCL 4.0
	Aroclor 1254	mg/kg	0.143	0.385	0.46	0.385	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Aroclor 1260*	mg/kg	--	--	0.0092	0.0092	mg/kg	--	--
	4-Methyl-2-pentanone	mg/kg	0.007	0.0143	0.016	0.0143	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Cyclohexane*	mg/kg	--	--	0.004	0.004	mg/kg	--	--
	Methylcyclohexane*	mg/kg	--	--	0.027	0.027	mg/kg	--	--
	Acenaphthene	mg/kg	0.1308	0.1395	0.140	0.1395	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Acenaphthylene*	mg/kg	--	--	0.120	0.120	mg/kg	--	--
	Fluoranthene	mg/kg	0.0979	0.208	0.235	0.208	mg/kg	95% Student's t UCL	ProUCL 4.0
	Naphthalene	mg/kg	0.082	0.1178	0.120	0.1178	mg/kg	95% KM (t) UCL	ProUCL 4.0

Notes:
FOD = frequency of detection
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram
* Due to the low frequency of detection, a mean and UCL were not calculated.

Table F.3-5
Plant Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TAL Metals			
Aluminum	7429-90-5	50	ORNL-Plants
Antimony	7440-36-0	5	ORNL-Plants
Arsenic	7440-38-2	18	ECO SSL
Barium	7440-39-3	500	ORNL-Plants
Beryllium	7440-41-7	10	ORNL-Plants
Cadmium	7440-43-9	32	ECO SSL
Calcium	7440-70-2	4	ORNL-Plants
Chromium	7440-47-3	1	ORNL-Plants
Cobalt	7440-48-4	13	ECO SSL
Copper	7440-50-8	70	ECO SSL
Iron	7439-89-6	NV	--
Lead	7439-92-1	120	ECO SSL
Magnesium	7439-95-4	NV	--
Manganese	7439-96-5	220	ECO SSL
Mercury	7439-97-6	0.3	ORNL-Plants
Nickel	7440-02-0	38	ECO SSL
Potassium	7440-09-7	NV	--
Selenium	7782-49-2	0.52	ECO SSL
Silver	7440-22-4	560	ECO SSL
Sodium	7440-23-5	NV	--
Thallium	7440-28-0	1	ORNL-Plants
Vanadium	7440-62-2	2	ORNL-Plants
Zinc	7440-66-6	160	ECO SSL
Pesticides/PCBs			
Aldrin	309-00-2	0.1	BTAG - Flora
beta-BHC	319-85-7	100	BTAG - Flora
alpha-Chlordane [1]	58-89-9	0.1	BTAG - Flora
Aroclor 1254	11097-69-1	NV	--
Aroclor 1260	11096-82-5	NV	--
TCL VOCs			
gamma-Chlordane [1]	78-93-3	NV	--
4-Methyl-2-Pentanone	108-10-1	100	BTAG - Flora
Acetone	67-64-1	NV	--
Benzene	71-43-2	0.1	BTAG - Flora
Bromomethane	74-83-9	NV	--
Carbon Disulfide	75-15-0	NV	--
Cyclohexane	110-82-7	NV	--
Dichlorodifluoromethane	75-71-8	NV	--
Ethylbenzene	100-41-4	0.1	BTAG - Flora
Methylcyclohexane	108-87-2	NV	--
Methylene Chloride	75-09-2	0.3	BTAG - Flora
Styrene	100-42-5	300	ORNL-Plants
Toluene	108-88-3	200	ORNL-Plants
Trichloroethene	79-01-6	0.3	BTAG - Flora
Xylenes (Total)	1330-20-7	0.1	BTAG - Flora

Table F.3-5
Plant Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TCL SVOCs			
2-Methylnaphthalene	91-57-6	NV	--
Bis(2-ethylhexyl)phthalate	117-81-7	NV	--
TCL PAHs			
Low Molecular Weight PAHs	--	NV	--
High Molecular Weight PAHs	--	NV	--

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
NV = No Value Available
TAL = Target Analyte List
TCL = Target Compound List
USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
ORNL - Plants - Toxilogical Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision Efroymson et al.)
BTAG - Flora - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
[1] = Chlordane BTAG Screening Level Used
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon

Table F.3-6
Plant Screening - Soil
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Inorganics						
Aluminum	7429-90-5	33,000	50	**6.6E+02**	21,462	**4.3E+02**
Antimony	7440-36-0	16.4	5	**3.3E+00**	11.94	**2.4E+00**
Arsenic	7440-38-2	16.1	18	8.9E-01	NC	NC
Barium	7440-39-3	180	500	3.6E-01	NC	NC
Beryllium	7440-41-7	1.6	10	1.6E-01	NC	NC
Cadmium	7440-43-9	0.31	32	9.7E-03	NC	NC
Calcium	7440-70-2	172,000	4	**4.3E+04**	172,000	**4.3E+04**
Chromium	7440-47-3	47	1	**4.7E+01**	30.95	**3.1E+01**
Cobalt	7440-48-4	13	13	1.0E+00	NC	NC
Copper	7440-50-8	40	70	5.7E-01	NC	NC
Iron	7439-89-6	34,000	NV	NC	NC	NC
Lead	7439-92-1	366	120	**3.1E+00**	241.3	**2.0E+00**
Magnesium	7439-95-4	74,800	NV	NC	NC	NC
Manganese	7439-96-5	550	220	**2.5E+00**	461.3	**2.1E+00**
Mercury	7439-97-6	0.49	0.3	**1.6E+00**	0.289	9.6E-01
Nickel	7440-02-0	33	38	8.7E-01	NC	NC
Potassium	7440-09-7	4,500	NV	NC	NC	NC
Selenium	7782-49-2	1	0.52	**2.1E+00**	0.764	**1.5E+00**
Silver	7440-22-4	2.1	560	3.8E-03	NC	NC
Sodium	7440-23-5	358	NV	NC	NC	NC
Thallium	7440-28-0	0.59	1	5.9E-01	NC	NC
Vanadium	7440-62-2	91	2	**4.6E+01**	54.94	**2.7E+01**
Zinc	7440-66-6	152	160	9.5E-01	NC	NC
Pesticides/PCBs						
Aldrin	309-00-2	0.00105	0.1	1.1E-02	NC	NC
beta-BHC	319-85-7	0.0055	100	5.5E-05	NC	NC
gamma-BHC (Lindane)	58-89-9	0.00099	0.1	9.9E-03	NC	NC
Aroclor 1254	11097-69-1	0.46	NV	NC	NC	NC
Aroclor 1260	11096-82-5	0.092	NV	NC	NC	NC
PCBs (Total)	--	1.0	40	2.5E-02	NC	NC
TCL VOCs						
2-Butanone	78-93-3	0.046	NV	NC	NC	NC
4-Methyl-2-Pentanone	108-10-1	0.016	100	1.6E-04	NC	NC
Acetone	67-64-1	0.25	NV	NC	NC	NC
Benzene	71-43-2	0.003225	0.1	3.2E-02	NC	NC
Bromomethane	74-83-9	0.002	NV	NC	NC	NC
Carbon Disulfide	75-15-0	0.0075	NV	NC	NC	NC
Cyclohexane	110-82-7	0.004	NV	NC	NC	NC
Dichlorodifluoromethane	75-71-8	0.001	NV	NC	NC	NC
Ethylbenzene	100-41-4	0.005	0.1	5.0E-02	NC	NC
Methylcyclohexane	108-87-2	0.0265	NV	NC	NC	NC
Methylene Chloride	75-09-2	0.0155	0.3	5.2E-02	NC	NC
Styrene	100-42-5	0.001	300	3.3E-06	NC	NC
Toluene	108-88-3	0.0125	200	6.3E-05	NC	NC
Trichloroethene	79-01-6	0.021	0.3	7.0E-02	NC	NC
Xylenes (Total)	1330-20-7	0.0605	0.1	6.1E-01	NC	NC
TCL SVOCs						
2-Methylnaphthalene	91-57-6	0.078	NV	NC	NC	NC
Bis(2-ethylhexyl)phthalate	117-81-7	0.058	NV	NC	NC	NC
TCL PAHs						
Low Molecular Weight PAHs	--	0.447	NV	NC	NC	NC
High Molecular Weight PAHs	--	0.738	NV	NC	NC	NC

Notes:

CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
NV = No Value Available
NC = Not Calculated
Hazard Quotient = Soil Concentration/Screening Level
EPC = Exposure Point Concentration
See Table F.3-3b for Total Low and High Molecular Weight PAHs
See Table F.3-3c for Total PCBs

Table F.3-7
Invertebrate and Microbial Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TAL Metals			
Aluminum	7429-90-5	NV	--
Antimony	7440-36-0	78	ECO SSL
Arsenic	7440-38-2	60	ORNL-Earthworm
Barium	7440-39-3	330	ECO SSL
Beryllium	7440-41-7	40	ECO SSL
Cadmium	7440-43-9	140	ECO SSL
Calcium	7440-70-2	NV	--
Chromium	7440-47-3	0.4	ORNL-Earthworm
Cobalt	7440-48-4	200	BTAG - Fauna
Copper	7440-50-8	80	ECO SSL
Iron	7439-89-6	200	ORNL - Microbial
Lead	7439-92-1	1,700	ECO SSL
Magnesium	7439-95-4	NV	--
Manganese	7439-96-5	450	ECO SSL
Mercury	7439-97-6	0.1	ORNL-Earthworm
Nickel	7440-02-0	280	ECO SSL
Potassium	7440-09-7	NV	--
Selenium	7782-49-2	4.1	ECO SSL
Silver	7440-22-4	50	ORNL - Microbial
Sodium	7440-23-5	NV	--
Thallium	7440-28-0	NV	--
Vanadium	7440-62-2	20	ORNL - Microbial
Zinc	7440-66-6	120	Eco SSL
Pesticides/PCBs			
Aldrin	309-00-2	0.1	BTAG - Fauna
beta-BHC	319-85-7	NV	--
alpha-Chlordane [1]	58-89-9	0.1	BTAG - Fauna
Aroclor 1254	11097-69-1	NV	--
Aroclor 1260	11096-82-5	NV	--
gamma-Chlordane [1]	78-93-3	NV	--
TCL VOCs			
4-Methyl-2-Pentanone	108-10-1	NV	--
Acetone	67-64-1	NV	--
Benzene	71-43-2	0.1	BTAG - Fauna
Bromomethane	74-83-9	NV	--
Carbon Disulfide	75-15-0	NV	--
Cyclohexane	110-82-7	NV	--
Dichlorodifluoromethane	75-71-8	NV	--
Ethylbenzene	100-41-4	0.1	BTAG - Fauna
Methylcyclohexane	108-87-2	NV	--
Methylene Chloride	75-09-2	0.3	BTAG - Fauna
Styrene	100-42-5	0.1	BTAG - Fauna
Toluene	108-88-3	0.1	BTAG - Fauna
Trichloroethene	79-01-6	0.3	BTAG - Fauna
Xylenes (Total)	1330-20-7	NV	--

Table F.3-7
Invertebrate and Microbial Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TCL SVOCs			
2-Methylnaphthalene	91-57-6	NV	--
Bis(2-ethylhexyl)phthalate	117-81-7	NV	--
TCL PAHs			
Low Molecular Weight PAHs	--	29	ECO SSL
High Molecular Weight PAHs	--	18	ECO SSL

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
NV = No Value Available
TAL = Target Analyte List
TCL = Target Compound List
USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
ORNL - Earthworms - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
ORNL - Microbial Processes - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
BTAG - Fauna - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
[1] = Chlordane BTAG Screening Level Used
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon

Table F.3-8
Invertebrate and Microbial Screening - Soil
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Inorganics						
Aluminum	7429-90-5	33,000	NV	NC	NC	NC
Antimony	7440-36-0	16.4	78	2.1E-01	NC	NC
Arsenic	7440-38-2	16.1	60	2.7E-01	NC	NC
Barium	7440-39-3	180	330	5.5E-01	NC	NC
Beryllium	7440-41-7	1.6	40	4.0E-02	NC	NC
Cadmium	7440-43-9	0.31	140	2.2E-03	NC	NC
Calcium	7440-70-2	172,000	NV	NC	NC	NC
Chromium	7440-47-3	47	0.4	**1.2E+02**	30.95	**7.7E+01**
Cobalt	7440-48-4	13	200	6.5E-02	NC	NC
Copper	7440-50-8	40	80	5.0E-01	NC	NC
Iron	7439-89-6	34,000	200	**1.7E+02**	25,860	**1.3E+02**
Lead	7439-92-1	366	1,700	2.2E-01	NC	NC
Magnesium	7439-95-4	74,800	NV	NC	NC	NC
Manganese	7439-96-5	550	450	**1.2E+00**	461.3	**1.0E+00**
Mercury	7439-97-6	0.49	0.100	**4.9E+00**	0.289	**2.9E+00**
Nickel	7440-02-0	33	280	1.2E-01	NC	NC
Potassium	7440-09-7	4,500	NV	NC	NC	NC
Selenium	7782-49-2	1.1	4	2.7E-01	NC	NC
Silver	7440-22-4	2.1	50	4.2E-02	NC	NC
Sodium	7440-23-5	358	NV	NC	NC	NC
Thallium	7440-28-0	0.59	NV	NC	NC	NC
Vanadium	7440-62-2	91	20	**4.6E+00**	54.94	**2.7E+00**
Zinc	7440-66-6	152	120	**1.3E+00**	106.4	8.9E-01
Pesticides/PCBs						
Aldrin	309-00-2	0.00105	0.1	1.1E-02	NC	NC
beta-BHC	319-85-7	0.0055	NV	NC	NC	NC
gamma-BHC (Lindane)	58-89-9	0.00099	0.1	9.9E-03	NC	NC
Aroclor 1254	11097-69-1	0.46	NV	NC	NC	NC
Aroclor 1260	11096-82-5	0.092	NV	NC	NC	NC
TCL VOCs						
2-Butanone	78-93-3	0.046	NV	NC	NC	NC
4-Methyl-2-Pentanone	108-10-1	0.016	NV	NC	NC	NC
Acetone	67-64-1	0.25	NV	NC	NC	NC
Benzene	71-43-2	0.003225	0.1	3.2E-02	NC	NC
Bromomethane	74-83-9	0.002	NV	NC	NC	NC
Carbon Disulfide	75-15-0	0.0075	NV	NC	NC	NC
Cyclohexane	110-82-7	0.004	NV	NC	NC	NC
Dichlorodifluoromethane	75-71-8	0.001	NV	NC	NC	NC
Ethylbenzene	100-41-4	0.005	0.1	5.0E-02	NC	NC
Methylcyclohexane	108-87-2	0.0265	NV	NC	NC	NC
Methylene Chloride	75-09-2	0.0155	0.3	5.2E-02	NC	NC
Styrene	100-42-5	0.001	0.1	1.0E-02	NC	NC
Toluene	108-88-3	0.0125	0.1	1.3E-01	NC	NC
Trichloroethene	79-01-6	0.021	0.3	7.0E-02	NC	NC
Xylenes (Total)	1330-20-7	0.0605	NV	NC	NC	NC
TCL SVOCs						
2-Methylnaphthalene	91-57-6	0.078	NV	NC	NC	NC
Bis(2-ethylhexyl)phthalate	117-81-7	0.058	NV	NC	NC	NC
TCL PAHs						
Low Molecular Weight PAHs	--	0.447	29	1.5E-02	NC	NC
High Molecular Weight PAHs	--	0.738	18	4.1E-02	NC	NC

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
NV = No Value Available
NC = Not Calculated
Hazard Quotient = Soil Concentration/Screening Level
EPC = Exposure Point Concentration
See Table F.3-3b for Total Low and High Molecular Weight PAHs

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Table F.3-9
Wildlife Profiles
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

							Preliminary Assessment					Refined Assessment					
Representative Species			Composition of Diet [1] (%)				Minimum Body Weight [1]	Maximum Body Weight [1]	Maximum Food Ingestion Rate [2]	Maximum Substrate Ingestion Rate [1]		Average Body Weight [1]	Average Food Ingestion Rate [2]	Average Substrate Ingestion Rate [1]	Home Range (ha)	Proportion of Year Species Active	AUFs
Food-web Classification	Common Name	Scientific Name	Plants (incl. fungi)	Inverte-brates	Small mammals	Fish	kg	kg	kg dw/day	% of dry intake	kg dry wt./day	kg	kg dw/day	kg dry wt./day			Study Area (0.8) hectares
Birds																	
soil-probing invertivore	American robin	*Turdus migratorius*	62%	38%			0.0635	0.103	0.020	5%	0.001	0.077	0.016	0.0008	0.48	1	1
large carnivore	Red-tailed hawk	*Buteo jamaicensis*			100%		0.957	1.235	0.063	0%	0	1.134	0.059	0	250	1	0.0032
Mammals																	
small herbivore	Meadow vole	*Microtus pennsylvanicus*	100%				0.017	0.0524	0.010	2.4%	0.00024	0.037	0.008	0.00019	0.037	1	1
medium carnivore	Red fox	*Vulpes vulpes*	17%	4%	79%		2.95	7.04	0.342	2.8%	0.0096	4.53	0.238	0.0067	96	1	0.0084
small invertivore	Short-tailed shrew	*Blarina brevicauda*	14%	86%			0.0125	0.0225	0.003	10%	0.00031	0.015	0.002	0.00021	0.39	1	1

Notes:
kg = Kilogram
kg dw/day = Kilogram Dry-weight per Day
L/day = Liter per Day

[1]Wildlife Exposure Factors Handbook. U.S. Environmental Protection Agency (EPA). 1993. Office of Research and Development. 2 Volumes. EPA/600/R93/187a&b. December.
[2] Estimated food intake rate (kg [dw]/day) calculated as follows:
FI ((kg/day) = 0.0687 $Wt.^{0.882}$ for mammals (red fox and short-tailed shrew)
FI ((g/day) = 0.577 $Wt.^{0.727}$ for herbivores (meadow vole)
FI ((g/day) = 0.301 $Wt.^{0.751}$ for non-passerine birds (red-tailed hawk)
FI ((g/day) = 0.398 $Wt.^{0.850}$ for passerine birds (american robin)
The soil ingestion rate for the american robin set equal to 38% of the american woodcock value (0.34*10.4%=4%), based on a robin diet of 38% invertbrates.

Table F.3-10
Wildlife TRVs
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

	CAS #	AVIAN TEST SPECIES				MAMMALIAN TEST SPECIES					AVIAN RECEPTORS				MAMMALIAN RECEPTORS					
											American Robin		Red-tailed Hawk		Meadow Vole		Red Fox		Short-tailed Shrew	
		Chronic LOAEL	Chronic NOAEL	Test Animal	Source	Chronic LOAEL	Chronic NOAEL	Test Animal	Test Animal Body Weight (kg)	Source	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL
		(mg/kg-bw/d)				(mg/kg-bw/d)					(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)	
Arsenic	7440-38-2	1.28E+01	5.14E+00	mallard duck	ORNL 1996	1.26	0.126	mouse	0.03	ORNL 1996	1.28E+01	5.14E+00	1.28E+01	5.14E+00	1.20E+00	1.20E-01	3.59E-01	3.59E-02	1.50E+00	1.50E-01
Cadmium	7440-43-9	2.00E+01	1.45E+00	mallard duck	ORNL 1996	10	1	rat	0.3	ORNL 1996	2.00E+01	1.45E+00	2.00E+01	1.45E+00	1.69E+01	1.69E+00	5.07E+00	5.07E-01	2.11E+01	2.11E+00
Chromium	7440-47-3	5.00E+00	1.00E+00	black duck	ORNL 1996	32.8	3.28	rat	0.35	ORNL 1996	5.00E+00	1.00E+00	5.00E+00	1.00E+00	5.75E+01	5.75E+00	1.73E+01	1.73E+00	7.21E+01	7.21E+00
Copper	7440-50-8	6.17E+01	4.70E+01	1 day old chicks	ORNL 1996	15.4	11.7	mink	1	ORNL 1996	6.17E+01	4.70E+01	6.17E+01	4.70E+01	3.51E+01	2.67E+01	1.06E+01	8.02E+00	4.40E+01	3.34E+01
Lead	7439-92-1	1.13E+01	1.13E+00	Japanese quail	ORNL 1996	80	8	rat	0.35	ORNL 1996	1.13E+01	1.13E+00	1.13E+01	1.13E+00	1.40E+02	1.40E+01	4.22E+01	4.22E+00	1.76E+02	1.76E+01
Mercury	7439-97-6	9.00E-01	4.50E-01	Japanese Quail	ORNL 1996	132	13.2	mink	1	ORNL 1996	9.00E-01	4.50E-01	9.00E-01	4.50E-01	3.01E+02	3.01E+01	9.05E+01	9.05E+00	3.77E+02	3.77E+01
Nickel	7440-02-0	1.07E+02	7.74E+01	mallard duckling	ORNL 1996	80	40	rat	0.35	ORNL 1996	1.07E+02	7.74E+01	1.07E+02	7.74E+01	1.40E+02	7.01E+01	4.22E+01	2.11E+01	1.76E+02	8.79E+01
Selenium	7782-49-2	8.00E-01	4.00E-01	mallard duck	ORNL 1996	0.33	0.2	rat	0.35	ORNL 1996	8.00E-01	4.00E-01	8.00E-01	4.00E-01	5.79E-01	3.51E-01	1.74E-01	1.05E-01	7.25E-01	4.40E-01
Silver	7440-22-4	1.24E+02	1.66E+01	turkey	Matuk et al. 1981	222	22.2	rat	0.35	Matuk et al. 1981	1.24E+02	1.66E+01	1.24E+02	1.66E+01	3.89E+02	3.89E+01	1.17E+02	1.17E+01	4.88E+02	4.88E+01
Zinc	7440-66-6	1.31E+02	1.45E+01	white leghorn hen	ORNL 1996	320	160	rat	0.35	ORNL 1996	1.31E+02	1.45E+01	1.31E+02	1.45E+01	5.61E+02	2.81E+02	1.69E+02	8.44E+01	7.03E+02	3.52E+02
PAHs																				
Acenaphthene	83-32-9	5.05E+00	1.01E+00	red-winged blackbird	USACE 1998	87.5	17.5	mouse	0.03	USACE 1998	5.05E+00	1.01E+00	5.05E+00	1.01E+00	8.30E+01	1.66E+01	2.50E+01	4.99E+00	1.04E+02	2.08E+01
Acenaphthylene	208-96-8	--	--	--	USACE 1998	500	100	rat	0.35	USACE 1998	NV	NV	NV	NV	8.77E+02	1.75E+02	2.64E+02	5.27E+01	1.10E+03	2.20E+02
Benzo(a)anthracene	56-55-3	--	--	--	USACE 1998	2	0.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	2.91E+00	2.91E-01	8.74E-01	8.74E-02	3.64E+00	3.64E-01
Benzo(a)pyrene	50-32-8	2.50E+00	5.00E-01	duck	ORNL 1996	10	1	mouse	0.03	ORNL 1996	2.50E+00	5.00E-01	2.50E+00	5.00E-01	9.49E+00	9.49E-01	2.85E+00	2.85E-01	1.19E+01	1.19E+00
Benzo(b)fluoranthene	205-99-2	--	--	--	ORNL 1996	10	1	mouse	0.03	ORNL 1996	NV	NV	NV	NV	9.49E+00	9.49E-01	2.85E+00	2.85E-01	1.19E+01	1.19E+00
Benzo(g,h,i)perylene	191-24-2	--	--	--	USACE 1998	2.5	0.5	mouse	0.03	USACE 1998	NV	NV	NV	NV	2.37E+00	4.74E-01	7.13E-01	1.43E-01	2.97E+00	5.95E-01
Benzo(k)fluoranthene	207-08-9	--	--	--	USACE 1998	72	7.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.05E+02	1.05E+01	3.15E+01	3.15E+00	1.31E+02	1.31E+01
Chrysene	218-01-9	--	--	--	USACE 1998	99	9.9	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.44E+02	1.44E+01	4.32E+01	4.32E+00	1.80E+02	1.80E+01
Dibenzo(a,h)anthracene	53-70-3	--	--	--	USACE 1998	13.33	1.333	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.94E+01	1.94E+00	5.82E+00	5.82E-01	2.43E+01	2.43E+00
Fluoranthene	206-44-0	--	--	--	USACE 1998	100	20	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.45E+02	2.91E+01	4.37E+01	8.74E+00	1.82E+02	3.64E+01
Indeno(1,2,3-cd)pyrene	193-39-5	--	--	--	USACE 1998	72	7.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.05E+02	1.05E+01	3.15E+01	3.15E+00	1.31E+02	1.31E+01
Phenanthrene	85-01-8	5.65E+00	1.13E+00	red-winged blackbird	USACE 1998	35	7	mouse	0.03	USACE 1998	5.65E+00	1.13E+00	5.65E+00	1.13E+00	3.32E+01	6.64E+00	9.98E+00	2.00E+00	4.16E+01	8.32E+00
Pyrene	129-00-0	--	--	--	USACE 1998	40	8	mouse	0.03	USACE 1998	NV	NV	NV	NV	3.80E+01	7.59E+00	1.14E+01	2.28E+00	4.76E+01	9.51E+00
Pesticides																				
4,4'-DDE	72-55-9	5.80E-01	5.80E-02	mallard duck	Kornbrust et al. 1986	230	23	rat	0.35	Kornbrust et al. 1986	5.80E-01	5.80E-02	5.80E-01	5.80E-02	4.03E+02	4.03E+01	1.21E+02	1.21E+01	5.06E+02	5.06E+01
4,4'-DDT	50-29-3	2.80E-02	2.80E-03	brown pelican	ORNL 1996	4	0.8	rat	0.35	ORNL 1996	2.80E-02	2.80E-03	2.80E-02	2.80E-03	7.01E+00	1.40E+00	2.11E+00	4.22E-01	8.79E+00	1.76E+00
alpha-Chlordane	5103-71-9	1.07E+01	2.14E+00	red-winged blackbird	Chlordane Value	3.9	0.39	mouse	0.03	ATSDR 1994	1.07E+01	2.14E+00	1.07E+01	2.14E+00	3.70E+00	3.70E-01	1.11E+00	1.11E-01	4.64E+00	4.64E-01
delta-BHC	319-86-8	2.25E+00	5.60E-01	Japanese quail	ORNL 1996	0.14	0.014	mink	1	ORNL 1996	2.25E+00	5.60E-01	2.25E+00	5.60E-01	3.19E-01	3.19E-02	9.60E-02	9.60E-03	4.00E-01	4.00E-02
Endosulfan sulfate	1031-07-8	1.00E+02	1.00E+01	gray partridge	Endosulfan Value	0.26	0.026	mouse	0.35	Endosulfan Value	1.00E+02	1.00E+01	1.00E+02	1.00E+01	4.56E-01	4.56E-02	1.37E-01	1.37E-02	5.71E-01	5.71E-02
Endrin aldehyde	7421-93-4	1.70E-01	2.80E-02	mallard duck	Endrin Value	0.92	0.092	mouse	0.03	Endrin Value	1.70E-01	2.80E-02	1.70E-01	2.80E-02	8.73E-01	8.73E-02	2.62E-01	2.62E-02	1.09E+00	1.09E-01
gamma-BHC	58-89-9	2.00E+01	2.00E+00	mallard duck	ORNL 1996	80	8	rat	0.35	ORNL 1996	2.00E+01	2.00E+00	2.00E+01	2.00E+00	1.40E+02	1.40E+01	4.22E+01	4.22E+00	1.76E+02	1.76E+01
gamma-Chlordane	5103-74-2	1.06E+01	2.14E+00	red-winged blackbird	Chlordane Value	3.9	0.39	mouse	0.03	ATSDR 1994	1.06E+01	2.14E+00	1.06E+01	2.14E+00	3.70E+00	3.70E-01	1.11E+00	1.11E-01	4.64E+00	4.64E-01
Heptachlor	76-44-8	1.25E+01	2.50E+00	pheasant	ORNL 1996	1	0.1	mink	1	ORNL 1996	1.25E+01	2.50E+00	1.25E+01	2.50E+00	2.28E+00	2.28E-01	6.85E-01	6.85E-02	2.86E+00	2.86E-01
Heptachlor epoxide	1024-57-3	4.95E+00	9.90E-01	Japanese quail	USACE 1998	0.25	0.025	rat	0.35	USACE 1998	4.95E+00	9.90E-01	4.95E+00	9.90E-01	4.38E-01	4.38E-02	1.32E-01	1.32E-02	5.49E-01	5.49E-02
Methoxychlor	72-43-5	1.45E+02	1.45E+01	adult chicken	ORNL 1996	8	4	rat	0.35	ORNL 1996	1.45E+02	1.45E+01	1.45E+02	1.45E+01	1.40E+01	7.01E+00	4.22E+00	2.11E+00	1.76E+01	8.79E+00
PCBs																				
Aroclor 1254	11097-69-1	4.10E+00	4.10E-01	screech owl	Aroclor 1242 Value	0.68	0.068	oldfield mouse	0.03	ORNL 1996	4.10E+00	4.10E-01	4.10E+00	4.10E-01	6.45E-01	6.45E-02	1.94E-01	1.94E-02	8.09E-01	8.09E-02
Aroclor 1260	11096-82-5	4.10E+00	4.10E-01	screech owl	Aroclor 1242 Value	0.68	0.068	oldfield mouse	0.03	ORNL 1996	4.10E+00	4.10E-01	4.10E+00	4.10E-01	6.45E-01	6.45E-02	1.94E-01	1.94E-02	8.09E-01	8.09E-02
Dioxin/Furans																				
2,3,7,8-TCDD	1746-01-6	1.40E-04	1.40E-05	ring-necked pheasant	ORNL 1996	0.00001	0.000001	mouse	0.03	ORNL 1996	1.40E-04	1.40E-05	1.40E-04	1.40E-05	9.49E-06	9.49E-07	2.85E-06	2.85E-07	1.19E-05	1.19E-06

Notes:
CAS = Chemical Abstract Service
TRV = Toxic Reference Value
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw/d = Body Weight Per Day
kg = kilogram
PAH = Polynuclear Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
USACE = U.S. Army Corps of Engineers
ORNL = Oak Ridge National Laboratory
NOAEL and LOAEL values were derived from acute values by applying an uncertainty factor of 150.

Source(s):

ATSDR 1994. ATSDR. 1994. Toxicological profile for Chlordane Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry.
Kornbrust et al. 1986. Kornbrust, D. et al. (1986), "Effects of 1,1-dichloro-2,2-bis[p-chlorophenyl]ethylene (DDE) on lactation in rats", Journal of Toxicology and Environmental Health 17(1):23-36.
ORNL 1996. Sample, B.E., D.M. Opresko and G.W. Suter II. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. ES/ER/TM-86/R3. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
USACE 1998. U.S. Army Corps of Engineers (USACE). 1998. Final Ecological Risk Assessment, RCRA Facility Investigation, for Sunflower Army Ammunition Plant, De Soto, Kansas. USACE Kansas City District.
Matuk et al. 1981. Matuk, Y., M. Gosh and C. McCulloch. 1981. Distribution of silver in the eyes and plasma proteins of the albino rat. Can. J. Ophthalmol. 16: 145-150. (Cited in ATSDR, 1990)

Table F.3-11
Soil Biocaccumulation/Bioconcentration Factors- Soil to Plant Pathway
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

					Preliminary Assessment		Refined Assessment			
Chemical	**CAS**	**Log K_{ow} Range**	**Selected K_{ow}**	**Source**	**BAF**	**Basis**	**C_s EPC (mg/kg)**	**BAF[1]**	**Basis**	**Source**
Inorganics										
ARSENIC	7440-38-2	-- - --	--	--	1.103	90th percentile	14.24	0.0375	Median	Bechtel Jacobs 1998
CADMIUM	7440-43-9	-- - --	--	--	3.25	90th percentile	0.217	1.244	$C_p = e^{(0.546*ln(Cs) - 0.475)}$	Bechtel Jacobs 1998
CHROMIUM	7440-47-3	-- - --	--	--	0.084	90th percentile	30.95	0.041	Median	Bechtel Jacobs 1998
COPPER	7440-50-8	-- - --	--	--	0.625	90th percentile	NC	NC	$C_p = e^{(0.394*ln(Cs) + 0.688)}$	Bechtel Jacobs 1998
LEAD	7439-92-1	-- - --	--	--	0.468	90th percentile	241.3	0.0238	$C_p = e^{(0.561*ln(Cs) - 1.328)}$	Bechtel Jacobs 1998
MERCURY	7439-97-6	-- - --	--	--	5.0	90th percentile	0.289	0.651	$C_p = e^{(0.544*ln(Cs) - 0.995)}$	Bechtel Jacobs 1998
NICKEL	7440-02-0	-- - --	--	--	1.411	90th percentile	NC	NC	$C_p = e^{(0.748*ln(Cs) + 2.223)}$	Bechtel Jacobs 1998
SELENIUM	7782-49-2	-- - --	--	--	3.012	90th percentile	0.764	0.494	$C_p = e^{(1.104*ln(Cs) - 0.677)}$	Bechtel Jacobs 1998
SILVER	7440-22-4	-- - --	--	--	0.037	90th percentile	NC	0.014	Median	Bechtel Jacobs 1998
ZINC	7440-66-6	-- - --	--	--	1.82	90th percentile	106.4	0.603	$C_p = e^{(0.554*ln(Cs) + 1.575)}$	Bechtel Jacobs 1998
Pesticides										
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	0.08	Maximum	NC	NC	$C_p = e^{(0.752*ln(Cs) - 2.512)}$	USEPA 2005
4,4'-DDT	50-29-3	5.56 - 7.01	6.53	USEPA 1995	0.62	Maximum	NC	NC	$C_p = e^{(0.752*ln(Cs) - 2.512)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	0.0086	K_{ow} Regression Eq.	Travis and Arms 1988
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	1	Default Value	NC	0.1653	K_{ow} Regression Eq.	Travis and Arms 1988
ENDOSULFAN SULFATE	1031-07-8	-- - --	--	--	1	Default Value	NC	0.2367	Endosulfan as Surrogate	--
ENDRIN ALDEHYDE	7421-93-4	-- - --	--	--	1	Default Value	NC	0.0461	Endrin as Surrogate	--
GAMMA-BHC (LINDANE)	58-89-9	3.61 - 3.9	3.73	USEPA 1995	1	Default Value	NC	0.2704	K_{ow} Regression Eq.	Travis and Arms 1988
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	0.0086	K_{ow} Regression Eq.	Travis and Arms 1988
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	1	Default Value	NC	0.0093	K_{ow} Regression Eq.	Travis and Arms 1988
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1	Default Value	NC	0.0499	K_{ow} Regression Eq.	Travis and Arms 1988
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	1	Default Value	NC	0.0448	K_{ow} Regression Eq.	Travis and Arms 1988
PCBs										
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	0.0068	K_{ow} Regression Eq.	0.39	0.0068	K_{ow} Regression Eq.	Travis and Arms 1988
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	0.0045	K_{ow} Regression Eq.	0.06	0.0045	K_{ow} Regression Eq.	Travis and Arms 1988
VOCs and SVOCs										
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	4.6	Anthracene as Surrogate	NC	NC	$C_p = e^{(-0.8556*ln(Cs) - 5.562)}$	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.1	USEPA 1995	4.6	Anthracene as Surrogate	NC	NC	$C_p = e^{(0.791*ln(Cs) - 1.144)}$	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	0.54	Maximum	NC	NC	$C_p = e^{(0.5944*ln(Cs) - 2.708)}$	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	3.3	Maximum	NC	NC	$C_p = e^{(0.975*ln(Cs) - 2.0615)}$	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	0.48	Maximum	NC	0.31	Median BAF	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1.6	Maximum	NC	NC	$C_p = e^{(1.183*ln(Cs) - 0.931)}$	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	1.0	Maximum	NC	NC	$C_p = e^{(0.860*ln(Cs) - 2.158)}$	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	1.05	Maximum	NC	NC	$C_p = e^{(0.594*ln(Cs) - 2.708)}$	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	0.23	Maximum	NC	0.13	Median BAF	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	5.12	USEPA 1995	6.0	Maximum	NC	0.5	Median BAF	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.65	USEPA 1995	0.15	Maximum	NC	0.11	Median BAF	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	11	Maximum	NC	NC	$C_p = e^{(0.620*ln(Cs) - 0.167)}$	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	5.11	USEPA 1995	3.7	Maximum	NC	0.72	Median BAF	USEPA 2005
Dioxin/Furans										
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	0.0075	K_{ow} Regression Eq.	NC	0.0065	K_{ow} Regression Eq.	Travis and Arms 1988

Notes:
CAS = Chemical Abstract Services
BAF = Bioaccumulation Factor
K_{ow} = Chemical octanol-water coefficient
NC = Not Calculated
C_s = Chemical Concentration in Soil
C_p = Chemical Concentration in Plant Matter (dry weight)
[1] = BAFs for chemical using Cp regression equation calculated by as follows: BAF = C_p/C_s

Source(s):

USEPA 1995: United States Environmental Protection Agency. 1995. Karickhoff, S.W. , and J.M. Long. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.
Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision
Bechtel Jacobs 1998: Bechtel Jacobs Company. September 1998. Emperical Models for the Uptake of Inorganic Chemical from Soil by Plants.
USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.
Travis and Arms 1988: Travis and Arms. 1988. Bioconcentration of Organics in Beef, Milk, and Vegetation. BAF values calculated for Tier I using lowest Kow value and for Tier II using the selected Kow value.
K_{ow} Regression Equation: BAF =10^((-0.578*K_{ow})+1.588))

Table F.3-12
Soil Biocaccumulation/Bioconcentration Factors - Soil to Invertebrate Pathway
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS	Log K_{ow} Range	Selected Log K_{ow}	Reference	K_{oc}	Reference	Preliminary Assessment		Refined Assessment			Source
							Value	Basis	C_s EPC (mg/kg)	BAF[1]	Basis	
Inorganics												
ARSENIC	7440-38-2	-- - --	--	--	--	--	0.523	90th percentile	14.24	0.1106	$C_e = e^{(0.706*ln(Cs) - 1.421)}$	Sample et al. 1998
CADMIUM	7440-43-9	-- - --	--	--	--	--	40.69	90th percentile	0.217	11.3272	$C_e = e^{(0.795*ln(Cs) + 2.114)}$	Sample et al. 1998
CHROMIUM	7440-47-3	-- - --	--	--	--	--	3.162	90th percentile	30.95	0.31	Median	Sample et al. 1998
COPPER	7440-50-8	-- - --	--	--	--	--	1.531	90th percentile	NC	0.52	Median	Sample et al. 1998
LEAD	7439-92-1	-- - --	--	--	--	--	1.522	90th percentile	241.3	0.2789	$C_e = e^{(0.807*ln(Cs) - 0.218)}$	Sample et al. 1998
MERCURY	7439-97-6	-- - --	--	--	--	--	20.6	90th percentile	0.289	1.69	Median	Sample et al. 1998
NICKEL	7440-02-0	-- - --	--	--	--	--	4.73	90th percentile	NC	1.06	Median	Sample et al. 1998
SELENIUM	7782-49-2	-- - --	--	--	--	--	1.34	90th percentile	0.764	0.9969	$C_e = e^{(0.733*ln(Cs) - 0.075)}$	Sample et al. 1998
SILVER	7440-22-4	-- - --	--	--	--	--	15.3	90th percentile	NC	2.05	Median	Sample et al. 1998
ZINC	7440-66-6	-- - --	--	--	--	--	12.9	90th percentile	106.4	3.7160	$C_e = e^{(0.328*ln(Cs) + 4.449)}$	Sample et al. 1998
Pesticides												
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	--	--	20.1	90th percentile	NC	NC	$C_e = e^{(0.88*ln(Cs) + 2.4771)}$	USEPA 2005
4,4'-DDT	50-29-3	5.56 - 7.01	6.53	USEPA 1995	--	--	29.4	90th percentile	NC	NC	$C_e = e^{(0.8689*ln(Cs) + 2.1287)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	5.89E+04	SRC, CF	4	Not Specified	NC	4.00	Not Specified	Edwards and Bohlen 1992
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	4.26E+03	SRC, CF	4.83	Jager Model	NC	4.83	Jager Model	USEPA 2005
ENDOSULFAN SULFATE	1031-07-8	-- - --	--	--	--	--	2.21	Endosulfan as Surrogate	NC	2.12	Endosulfan as Surrogate	--
ENDRIN ALDEHYDE	7421-93-4	-- - --	--	--	--	--	3.6	Endrin as Surrogate	NC	3.60	Endrin as Surrogate	--
GAMMA-BHC (LINDANE)	58-89-9	3.61 - 3.9	3.73	USEPA 1995	1.08E+03	SRC, CF	12.76	Jager Model	NC	9.08	Jager Model	USEPA 2005
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	5.89E+04	SRC, CF	4	Not Specified	NC	4.00	Not Specified	Edwards and Bohlen 1992
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	3.48E+03	SRC, CF	3	Not Specified	NC	3.00	Not Specified	Edwards and Bohlen 1992
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1.06E+01	SRC, CF	8.39	Not Specified	NC	8.39	Not Specified	USEPA 1999
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	8.00E+04	SRC, CF	5.19	Jager Model	NC	1.83	Jager Model	USEPA 2005
PCBs												
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	--	--	15.9	90th percentile	0.385	6.67	Median	Sample et al. 1998
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	--	--	15.9	90th percentile	0.0639	6.67	Median	Sample et al. 1998
VOCs and SVOCs												
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	1.09E+04	USEPA 2005	4.13	Jager Model	NC	1.32	Jager Model	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.07	USEPA 1995	9.47E+02	USEPA 2005	20.5	Jager Model	NC	20.47	Jager Model	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	3.58E+05	USEPA 2005	1.70	Jager Model	NC	1.42	Jager Model	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	9.69E+05	USEPA 2005	1.89	Jager Model	NC	1.19	Jager Model	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	5.96E+05	USEPA 2005	3.46	Jager Model	NC	2.32	Jager Model	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1.43E+06	USEPA 2005	5.31	Jager Model	NC	2.63	Jager Model	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	5.96E+05	USEPA 2005	2.67	Jager Model	NC	2.32	Jager Model	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	2.48E+05	USEPA 2005	2.45	Jager Model	NC	2.05	Jager Model	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	1.79E+06	USEPA 2005	3.02	Jager Model	NC	2.06	Jager Model	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	4.95	USEPA 1995	4.17E+04	USEPA 2005	6.54	Jager Model	NC	2.71	Jager Model	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.584	USEPA 1995	1.17E+06	USEPA 2005	3.35	Jager Model	NC	2.55	Jager Model	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	3.30E+04	USEPA 2005	1.60	Jager Model	NC	1.54	Jager Model	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	4.88	USEPA 1995	6.27E+04	USEPA 2005	5.65	Jager Model	NC	1.57	Jager Model	USEPA 2005
Dioxin/Furans												
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	--	--	22.2	90th percentile	NC	11.0	Median	Sample et al. 1998

Notes:
CAS = Chemical Abstract Services
C_s = Chemical Concentration in Soil
C_e = Chemical Concentration in Earthworm (dry weight)
K_{ow} = Chemical octanol-water coefficient
K_{oc} = Chemical water to soil partitioning coefficient
K_{ww} = Chemical worm to soil partitioning coefficient
foc = mean fraction organic content in soil (0.0112 mean from physical samples - see Appendix C.1)
[1] = BAFs for chemical using Ce regression equation calculated by as follows: BAF = βC_s

Source(s):
USEPA 1995: United States Environmental Protection Agency. Karickhoff, S.W. , and J.M. Long. 1995. Summary of Measured, Calculated, and Recommended Log_dK_w Values. Environmental Research Laboratory. Athens, Georgia.
Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision
Sample et al. 1998: Sample, B.E., Beauchamp, J.J., Efroymson, R.A., Sutter, G.W., Ashwood, T.L., February 1998. Development and Validation of Bioaccumulation Models for Earthworms.
Jager Model: As presented in USEPA 2005, Guidance for Developing Ecological Screening Levels, Appendix 4-1, Table 5.
BAF = K_{ww}(L/kg worl dw)/K_d (L/kg soil dw)
K_{ww} (dry weight) = 10^(0.87*logK_{ow} - 2.0) / 0.16
Wet weight to dry weight assuming 16% solids
$K_d = f_{oc} * K_{oc}$
foc = 0.017 from site specific physical soil data
Note: The maximum Kow utilized for the Tier I calculation and the Selected Kow utilized for the Tier II calculation.
Edwards and Bohlen 1992: Edwards, C.A. and Bohlen, P.J. 1992. The effects of toxic chemicals on earthworms. Reviews of Environmental Contamination and Toxicology, 125: 23-99.
USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.
SRC/CF: Syracuse Research Corporation (SRC). Physical Properties Database. http://www.syrres.com/esc/physdemo.htm

Table F.3-13
Soil Bioaccumulation/Bioconcentration Factors - Soil to Mammal Pathway
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS	Log K_{ow} Range	Selected K_{ow}	Reference	Preliminary Assessment		Refined Assessment			Source
					Value	Basis	C_s (mg/kg)	BAF[1]	Basis	
Inorganics										
ARSENIC	7440-38-2	-- - --	--	--	0.0149	90th percentile	14.24	0.0049	$C_m = e^{(0.819*ln(Cs) - 4.847)}$	Sample et al. 1998
CADMIUM	7440-43-9	-- - --	--	--	3.991	90th percentile	0.217	0.6371	$C_m = e^{(0.472*ln(Cs) - 1.257)}$	Sample et al. 1998
CHROMIUM	7440-47-3	-- - --	--	--	0.333	90th percentile	30.95	0.0931	$C_m = e^{(0.734*ln(Cs) - 1.46)}$	Sample et al. 1998
COPPER	7440-50-8	-- - --	--	--	1.045	90th percentile	NC	NC	$C_m = e^{(0.144*ln(Cs) + 2.042)}$	Sample et al. 1998
LEAD	7439-92-1	-- - --	--	--	0.286	90th percentile	241.3	0.0506	$C_m = e^{(0.442*ln(Cs) + 0.0761)}$	Sample et al. 1998
MERCURY	7439-97-6	-- - --	--	--	0.192	90th percentile	0.289	0.0543	Median	Sample et al. 1998
NICKEL	7440-02-0	-- - --	--	--	0.589	90th percentile	NC	NC	$C_m = e^{(0.466*ln(Cs) - 0.246)}$	Sample et al. 1998
SELENIUM	7782-49-2	-- - --	--	--	1.187	90th percentile	0.764	0.7804	$C_m = e^{(0.376*ln(Cs) -0.416)}$	Sample et al. 1998
SILVER	7440-22-4	-- - --	--	--	0.501	90th percentile	NC	0.004	Median	Sample et al. 1998
ZINC	7440-66-6	-- - --	--	--	2.69	90th percentile	106.4	1.0258	$C_m = e^{(0.071*ln(Cs) + 4.363)}$	Sample et al. 1998
Pesticides										
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	1	Default Value	NC	NC	$C_m = e^{(0.641*ln(Cd) + 3.640)}$	USEPA 2005
4,4'-DDT	50-29-3	5.56 - 7.01	6.53	USEPA 1995	1	Default Value	NC	NC	$C_m = e^{(0.725*ln(Cd) + 1.179)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	1	Default Value	--
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	1	Default Value	NC	1	Default Value	--
ENDOSULFAN SULFATE	1031-07-8	-- - --	--	--	1	Default Value	NC	1	Default Value	--
ENDRIN ALDEHYDE	7421-93-4	-- - --	--	--	1	Default Value	NC	1	Default Value	--
GAMMA-BHC (LINDANE)	58-89-9	3.61 - 3.9	3.73	USEPA 1995	1	Default Value	NC	1	Default Value	--
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	1	Default Value	--
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	1	Default Value	NC	1	Default Value	--
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1	Default Value	NC	1	Default Value	--
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	1	Default Value	NC	1	Default Value	--
PCBs										
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	1	Default Value	0.385	1	Default Value	--
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	1	Default Value	0.0639	1	Default Value	--
VOCs and SVOCs										
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.07	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	5.12	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.65	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	5.11	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
Dioxin/Furans										
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	2.2	90th percentile	0.00000959	0.7199	$C_m = e^{(0.1089*ln(Cs) + 0.7044)}$	Sample et al. 1998

Notes:

CAS = Chemical Abstract Services

C_s = Chemical Concentration in Soil

C_d = Chemical Concentration in Prey (assumed to be 100% earthworms (dry weight))

C_m = Chemical Concentration in Mammal (dry weight)

K_{ow} = Chemical octanol to water partitioning coefficient

[1] = BAFs for chemical using Ce regression equation calculated by as follows: BAF = C_m/C_s

Source(s):

USEPA 1995: United States Environmental Protection Agency. Karickhoff, S.W. , and J.M. Long. 1995. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.

Sample et al. 1998: Sample et al. 1998. Development and Validation of Bioaccumulation Models for Small Mammals.

Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision

USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.

Travis and Arms 1988: Travis and Arms. 1988. Bioconcentration of Organics in Beef, Milk, and Vegetation. BAF values calculated for Tier I using lowest Kow value and for Tier II using the selected Kow value.

K_{ow} Regression Equation: BAF =10^((-0.578*K_{ow})+1.588))

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Table F.3-14
Preliminary Wildlife Risk Characterization - Meadow Vole
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment									
				Soil									
				Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics													
Arsenic	7440-38-2	1.20E-01	1.20E+00	16.1	1.1E+00	1.8E+01	1.8E-01	1.8E+00	**8.93E+01**	**8.9E+00**	**Y**	14.24	**7.9E+01**
Cadmium	7440-43-9	1.69E+00	1.69E+01	0.31	3.3E+00	1.0E+00	8.8E-01	8.8E+00	3.5E-01	3.5E-02	N	--	--
Chromium	7440-47-3	5.75E+00	5.75E+01	47	8.4E-02	3.9E+00	9.1E+01	9.1E+02	5.2E-01	5.2E-02	N	--	--
Copper	7440-50-8	2.67E+01	3.51E+01	40	6.3E-01	2.5E+01	7.0E+01	9.2E+01	5.7E-01	4.3E-01	N	--	--
Lead	7439-92-1	1.40E+01	1.40E+02	366	4.7E-01	1.7E+02	4.8E+01	4.8E+02	**7.5E+00**	7.5E-01	**Y**	241.3	**5.0E+00**
Mercury	7439-97-6	3.01E+01	3.01E+02	0.49	5.0E+00	2.5E+00	1.0E+01	1.0E+02	4.8E-02	4.8E-03	N	--	--
Nickel	7440-02-0	7.01E+01	1.40E+02	33	1.4E+00	4.7E+01	8.3E+01	1.7E+02	4.0E-01	2.0E-01	N	--	--
Selenium	7782-49-2	3.51E-01	5.79E-01	1.1	3.0E+00	3.3E+00	2.0E-01	3.2E-01	**5.6E+00**	**3.4E+00**	**Y**	0.764	**3.9E+00**
Silver	7440-22-4	3.89E+01	3.89E+02	2.1	3.7E-02	7.8E-02	1.1E+03	1.1E+04	1.9E-03	1.9E-04	N	--	--
Zinc	7440-66-6	2.81E+02	5.61E+02	152	1.8E+00	2.8E+02	2.6E+02	5.2E+02	5.9E-01	2.9E-01	N	--	--
Dioxin/Furans													
Total 2,3,7,8-TCDD Equivalents	1746-01-6	9.49E-07	9.49E-06	3.6E-06	7.5E-03	2.7E-08	5.1E-05	5.1E-04	7.0E-02	7.0E-03	N	--	--
Pesticides/PCBs													
Aldrin	309-00-2	3.51E-01	1.75E+00	0.00105	1.0E+00	1.1E-03	5.8E-01	2.9E+00	1.8E-03	3.6E-04	N	--	--
beta-BHC	319-85-7	7.01E-01	3.51E+00	0.0055	1.0E+00	5.5E-03	1.2E+00	5.8E+00	4.7E-03	9.4E-04	N	--	--
gamma-BHC (Lindane)	58-89-9	1.40E+01	1.40E+02	0.00099	1.0E+00	9.9E-04	2.3E+01	2.3E+02	4.3E-05	4.3E-06	N	--	--
Aroclor 1254	11097-69-1	6.45E-02	6.45E-01	0.46	6.8E-03	3.1E-03	3.6E+00	3.6E+01	1.3E-01	1.3E-02	N	--	--
Aroclor 1260	11096-82-5	6.45E-02	6.45E-01	0.092	4.5E-03	4.2E-04	3.8E+00	3.8E+01	2.4E-02	2.4E-03	N	--	--
TCL PAHs													
Acenaphthene	83-32-9	1.66E+01	8.30E+01	0.14	4.6E+00	6.4E-01	6.1E+00	3.1E+01	2.3E-02	4.6E-03	N	--	--
Acenaphthylene	208-96-8	1.75E+02	8.77E+02	0.12	4.6E+00	5.5E-01	6.4E+01	3.2E+02	1.9E-03	3.7E-04	N	--	--
Benzo(a)anthracene	56-55-3	2.91E-01	2.91E+00	0.036	5.4E-01	1.9E-02	8.8E-01	8.8E+00	4.1E-02	4.1E-03	N	--	--
Benzo(a)pyrene	50-32-8	9.49E-01	9.49E+00	0.02	3.3E+00	6.6E-02	4.9E-01	4.9E+00	4.1E-02	4.1E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	9.49E-01	9.49E+00	0.015	4.8E-01	7.2E-03	3.2E+00	3.2E+01	4.7E-03	4.7E-04	N	--	--
Benzo(k)fluoranthene	207-08-9	1.05E+01	1.05E+02	0.017	1.0E+00	1.7E-02	1.7E+01	1.7E+02	9.8E-04	9.8E-05	N	--	--
Chrysene	218-01-9	1.44E+01	1.44E+02	0.054	1.1E+00	5.7E-02	2.3E+01	2.3E+02	2.4E-03	2.4E-04	N	--	--
Fluoranthene	206-44-0	2.91E+01	1.45E+02	0.2345	6.0E+00	1.4E+00	8.2E+00	4.1E+01	2.9E-02	5.7E-03	N	--	--
Phenanthrene	85-01-8	6.64E+00	3.32E+01	0.067	1.1E+01	7.4E-01	1.0E+00	5.1E+00	6.5E-02	1.3E-02	N	--	--
Pyrene	129-00-0	7.59E+00	3.80E+01	0.0215	3.7E+00	8.0E-02	3.5E+00	1.7E+01	6.2E-03	1.2E-03	N	--	--

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10
BW = Minimum Body Weigth of Receptor (kg)
IR_{food} = Maximum Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)
DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = 100% Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

Meadow Vole Specific Data from Table F.3-9

BW=	0.017	kg
IR_{food} =	0.010	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	1.00	unitless
IR_{soil} =	0.00024	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration
LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration
EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.3-15
Refined Wildlife Risk Characterization - Meadow Vole
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment						
				Soil						
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics										
Arsenic	7440-38-2	1.20E-01	1.20E+00	14.24	3.8E-02	5.3E-01	9.0E+00	9.0E+01	**1.6E+00**	1.6E-01
Lead	7439-92-1	1.40E+01	1.40E+02	241.3	2.4E-02	5.8E+00	1.4E+03	1.4E+04	1.8E-01	1.8E-02
Selenium	7782-49-2	3.51E-01	5.79E-01	0.764	4.9E-01	3.8E-01	3.1E+00	5.2E+00	2.4E-01	1.5E-01

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Meadow Vole Specific Data from Table F.3-9

BW=	0.037	kg
IR_{food} =	0.008	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	1.00	unitless
IR_{soil} =	0.00019	kg dw/day
AF =	1	unitless

Table F.3-16
Preliminary Wildlife Risk Characterization - Short-tailed Shrew
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																
Arsenic	7440-38-2	1.50E-01	1.50E+00	16.1	1.1E+00	1.8E+01	5.2E-01	8.4E+00	Plant	5.2E-01	5.2E+00	**3.1E+01**	**3.1E+00**	**Y**	14.24	**2.8E+01**
Cadmium	7440-43-9	2.11E+00	2.11E+01	0.31	3.3E+00	1.0E+00	4.1E+01	1.3E+01	Invertebrate	2.2E-01	2.2E+00	**1.4E+00**	1.4E-01	**Y**	0.217	**1.0E+00**
Chromium	7440-47-3	7.21E+00	7.21E+01	47	8.4E-02	3.9E+00	3.2E+00	1.5E+02	Invertebrate	9.2E+00	9.2E+01	**5.1E+00**	5.1E-01	**Y**	30.95	**3.4E+00**
Copper	7440-50-8	3.34E+01	4.40E+01	40	6.3E-01	2.5E+01	1.5E+00	6.1E+01	Invertebrate	8.5E+01	1.1E+02	4.7E-01	3.6E-01	N	--	--
Lead	7439-92-1	1.76E+01	1.76E+02	366	4.7E-01	1.7E+02	1.5E+00	5.6E+02	Invertebrate	4.5E+01	4.5E+02	**8.1E+00**	8.1E-01	**Y**	241.3	**5.4E+00**
Mercury	7439-97-6	3.77E+01	3.77E+02	0.49	5.0E+00	2.5E+00	2.1E+01	1.0E+01	Invertebrate	7.6E+00	7.6E+01	6.5E-02	6.5E-03	N	--	--
Nickel	7440-02-0	8.79E+01	1.76E+02	33	1.4E+00	4.7E+01	4.7E+00	1.6E+02	Invertebrate	7.6E+01	1.5E+02	4.4E-01	2.2E-01	N	--	--
Selenium	7782-49-2	4.40E-01	7.25E-01	1.1	3.0E+00	3.3E+00	1.3E+00	1.5E+00	Plant	5.9E-01	9.7E-01	**1.9E+00**	**1.1E+00**	**Y**	0.764	**1.3E+00**
Silver	7440-22-4	4.88E+01	4.88E+02	2.1	3.7E-02	7.8E-02	1.5E+01	3.2E+01	Invertebrate	1.3E+01	1.3E+02	1.6E-01	1.6E-02	N	--	--
Zinc	7440-66-6	3.52E+02	7.03E+02	152	1.8E+00	2.8E+02	1.3E+01	2.0E+03	Invertebrate	1.1E+02	2.3E+02	**1.3E+00**	6.7E-01	**Y**	106.4	9.4E-01
Dioxin/Furans																
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.19E-06	1.19E-05	3.6E-06	7.5E-03	2.7E-08	2.2E+01	7.9E-05	Invertebrate	2.2E-07	2.2E-06	**1.6E+01**	**1.6E+00**	**Y**	9.59E-06	**4.3E+01**
Pesticides/PCBs																
Aldrin	309-00-2	4.40E-01	2.20E+00	0.00105	1.0E+00	1.1E-03	3.3E+00	3.5E-03	Invertebrate	5.4E-01	2.7E+00	2.0E-03	3.9E-04	N	--	--
beta-BHC	319-85-7	8.79E-01	4.40E+00	0.0055	1.0E+00	5.5E-03	2.9E+00	1.6E-02	Invertebrate	1.2E+00	6.1E+00	4.5E-03	8.9E-04	N	--	--
gamma-BHC (Lindane)	58-89-9	1.76E+01	1.76E+02	0.00099	1.0E+00	9.9E-04	1.3E+01	1.3E-02	Invertebrate	5.7E+00	5.7E+01	1.7E-04	1.7E-05	N	--	--
Aroclor 1254	11097-69-1	8.09E-02	8.09E-01	0.46	6.8E-03	3.1E-03	1.6E+01	7.3E+00	Invertebrate	2.1E-02	2.1E-01	**2.2E+01**	**2.2E+00**	**Y**	0.39	**1.8E+01**
Aroclor 1260	11096-82-5	8.09E-02	8.09E-01	0.092	4.5E-03	4.2E-04	1.6E+01	1.5E+00	Invertebrate	2.1E-02	2.1E-01	**4.4E+00**	4.4E-01	**Y**	0.06	**3.0E+00**
TCL PAHs																
Acenaphthene	83-32-9	2.08E+01	1.04E+02	0.14	4.6E+00	6.4E-01	4.1E+00	5.8E-01	Plant	1.8E+01	9.2E+01	7.6E-03	1.5E-03	N	--	--
Acenaphthylene	208-96-8	2.20E+02	1.10E+03	0.12	4.6E+00	5.5E-01	2.0E+01	2.5E+00	Invertebrate	4.5E+01	2.2E+02	2.7E-03	5.4E-04	N	--	--
Benzo(a)anthracene	56-55-3	3.64E-01	3.64E+00	0.036	5.4E-01	1.9E-02	1.7E+00	6.1E-02	Invertebrate	8.4E-01	8.4E+00	4.3E-02	4.3E-03	N	--	--
Benzo(a)pyrene	50-32-8	1.19E+00	1.19E+01	0.02	3.3E+00	6.6E-02	1.9E+00	3.8E-02	Plant	1.5E+00	1.5E+01	1.4E-02	1.4E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	1.19E+00	1.19E+01	0.015	4.8E-01	7.2E-03	3.5E+00	5.2E-02	Invertebrate	1.4E+00	1.4E+01	1.1E-02	1.1E-03	N	--	--
Benzo(k)fluoranthene	207-08-9	1.31E+01	1.31E+02	0.017	1.0E+00	1.7E-02	2.7E+00	4.5E-02	Invertebrate	2.0E+01	2.0E+02	8.6E-04	8.6E-05	N	--	--
Chrysene	218-01-9	1.80E+01	1.80E+02	0.054	1.1E+00	5.7E-02	2.5E+00	1.3E-01	Invertebrate	2.9E+01	2.9E+02	1.8E-03	1.8E-04	N	--	--
Fluoranthene	206-44-0	3.64E+01	1.82E+02	0.2345	6.0E+00	1.4E+00	6.5E+00	1.5E+00	Invertebrate	2.3E+01	1.1E+02	1.0E-02	2.1E-03	N	--	--
Phenanthrene	85-01-8	8.32E+00	4.16E+01	0.067	1.1E+01	7.4E-01	1.6E+00	1.1E-01	Plant	3.1E+00	1.6E+01	2.1E-02	4.3E-03	N	--	--
Pyrene	129-00-0	9.51E+00	4.76E+01	0.0215	3.7E+00	8.0E-02	5.6E+00	1.2E-01	Invertebrate	6.9E+00	3.4E+01	3.1E-03	6.2E-04	N	--	--

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10
BW = Minimum Body Weigth of Receptor (kg)
IR_{food} = Maximum Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)
DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = 100% Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

Short-tailed Shrew Specific Data from Table F.3-9

BW=	0.0125	kg
IR_{food} =	0.003	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00031	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Screening Level
LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Screening Level
EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.3-17
Refined Wildlife Risk Characterization - Short-tailed Shrew
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment								
				Soil								
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics												
Arsenic	7440-38-2	1.50E-01	1.50E+00	14.24	3.8E-02	5.3E-01	1.11E-01	1.6E+00	5.5E+00	5.5E+01	**2.6E+00**	2.6E-01
Cadmium	7440-43-9	2.11E+00	2.11E+01	0.217	1.2E+00	2.7E-01	1.1E+01	2.5E+00	1.6E+00	1.6E+01	1.4E-01	1.4E-02
Chromium	7440-47-3	7.21E+00	7.21E+01	30.95	4.1E-02	1.3E+00	3.1E-01	9.5E+00	1.4E+02	1.4E+03	2.1E-01	2.1E-02
Lead	7439-92-1	1.76E+01	1.76E+02	241.3	2.4E-02	5.8E+00	2.8E-01	6.7E+01	3.8E+02	3.8E+03	6.4E-01	6.4E-02
Selenium	7782-49-2	4.40E-01	7.25E-01	0.764	4.9E-01	3.8E-01	1.0E+00	7.6E-01	3.2E+00	5.3E+00	2.4E-01	1.4E-01
Zinc	7440-66-6	3.52E+02	7.03E+02	106.4	6.0E-01	6.4E+01	3.7E+00	4.0E+02	7.8E+02	1.6E+03	1.4E-01	6.8E-02
Dioxin/Furans												
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.19E-06	1.19E-05	9.59E-06	6.5E-03	6.2E-08	1.1E+01	1.1E-04	9.3E-07	9.3E-06	**1.0E+01**	1.0E+00
Pesticides/PCBs												
Aroclor 1254	11097-69-1	8.09E-02	8.09E-01	0.385	6.8E-03	2.6E-03	6.7E+00	2.6E+00	1.0E-01	1.0E+00	**3.7E+00**	3.7E-01
Aroclor 1260	11096-82-5	8.09E-02	8.09E-01	0.0639	4.5E-03	2.9E-04	6.7E+00	4.3E-01	1.0E-01	1.0E+00	6.2E-01	6.2E-02

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

Short-tailed Shrew Specific Data from Table F.3-9

BW=	0.015	kg
IR_{food} =	0.002	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.14	unitless
DF_{inv} =	0.86	unitless
IR_{soil} =	0.00021	kg dw/day
AF =	1.000	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.3-18
Preliminary Wildlife Risk Characterization - Red Fox
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment														
				Soil														
				Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																		
Arsenic	7440-38-2	3.59E-02	3.59E-01	16.1	1.1E+00	1.8E+01	5.2E-01	8.4E+00	1.5E-02	2.4E-01	Plant	2.7E-01	2.7E+00	**5.9E+01**	**5.9E+00**	**Y**	14.24	**5.2E+01**
Cadmium	7440-43-9	5.07E-01	5.07E+00	0.31	3.3E+00	1.0E+00	4.1E+01	1.3E+01	4.0E+00	1.2E+00	Invertebrate	1.1E-01	1.1E+00	**2.9E+00**	2.9E-01	**Y**	0.217	**2.0E+00**
Chromium	7440-47-3	1.73E+00	1.73E+01	47	8.4E-02	3.9E+00	3.2E+00	1.5E+02	3.3E-01	1.6E+01	Invertebrate	4.7E+00	4.7E+01	**1.0E+01**	**1.0E+00**	**Y**	30.95	**6.6E+00**
Copper	7440-50-8	8.02E+00	1.06E+01	40	6.3E-01	2.5E+01	1.5E+00	6.1E+01	1.0E+00	4.2E+01	Invertebrate	4.4E+01	5.8E+01	9.0E-01	6.8E-01	N	--	--
Lead	7439-92-1	4.22E+00	4.22E+01	366	4.7E-01	1.7E+02	1.5E+00	5.6E+02	2.9E-01	1.0E+02	Invertebrate	2.3E+01	2.3E+02	**1.6E+01**	**1.6E+00**	**Y**	241.3	**1.0E+01**
Mercury	7439-97-6	9.05E+00	9.05E+01	0.49	5.0E+00	2.5E+00	2.1E+01	1.0E+01	1.9E-01	9.4E-02	Invertebrate	3.8E+00	3.8E+01	1.3E-01	1.3E-02	N	--	--
Nickel	7440-02-0	2.11E+01	4.22E+01	33	1.4E+00	4.7E+01	4.7E+00	1.6E+02	5.9E-01	1.9E+01	Invertebrate	3.8E+01	7.6E+01	8.6E-01	4.3E-01	N	--	--
Selenium	7782-49-2	1.05E-01	1.74E-01	1.1	3.0E+00	3.3E+00	1.3E+00	1.5E+00	1.2E+00	1.3E+00	Plant	3.0E-01	4.9E-01	**3.7E+00**	**2.2E+00**	**Y**	0.764	**2.6E+00**
Silver	7440-22-4	1.17E+01	1.17E+02	2.1	3.7E-02	7.8E-02	1.5E+01	3.2E+01	5.0E-01	1.1E+00	Invertebrate	6.6E+00	6.6E+01	3.2E-01	3.2E-02	N	--	--
Zinc	7440-66-6	8.44E+01	1.69E+02	152	1.8E+00	2.8E+02	1.3E+01	2.0E+03	2.7E+00	4.1E+02	Invertebrate	5.6E+01	1.1E+02	**2.7E+00**	**1.3E+00**	**Y**	106.4	**1.9E+00**
Dioxin/Furans																		
Total 2,3,7,8-TCDD Equivalents	1746-01-6	2.85E-07	2.85E-06	3.6E-06	7.5E-03	2.7E-08	2.2E+01	7.9E-05	2.2E+00	7.9E-06	Invertebrate	1.1E-07	1.1E-06	**3.2E+01**	**3.2E+00**	**Y**	9.59E-06	**8.7E+01**
Pesticides/PCBs																		
Aldrin	309-00-2	1.05E-01	5.27E-01	0.00105	1.0E+00	1.1E-03	3.3E+00	3.5E-03	1.0E+00	1.1E-03	Invertebrate	2.7E-01	1.4E+00	3.8E-03	7.7E-04	N	--	--
beta-BHC	319-85-7	2.11E-01	1.05E+00	0.0055	1.0E+00	5.5E-03	2.9E+00	1.6E-02	1.0E+00	5.5E-03	Invertebrate	6.3E-01	3.1E+00	8.8E-03	1.8E-03	N	--	--
gamma-BHC (Lindane)	58-89-9	4.22E+00	4.22E+01	0.00099	1.0E+00	9.9E-04	1.3E+01	1.3E-02	1.0E+00	9.9E-04	Invertebrate	2.8E+00	2.8E+01	3.5E-04	3.5E-05	N	--	--
Aroclor 1254	11097-69-1	1.94E-02	1.94E-01	0.46	6.8E-03	3.1E-03	1.6E+01	7.3E+00	1.0E+00	4.6E-01	Invertebrate	1.1E-02	1.1E-01	**4.4E+01**	**4.4E+00**	**Y**	0.385	**3.7E+01**
Aroclor 1260	11096-82-5	1.94E-02	1.94E-01	0.092	4.5E-03	4.2E-04	1.6E+01	1.5E+00	1.0E+00	9.2E-02	Invertebrate	1.1E-02	1.1E-01	**8.8E+00**	8.8E-01	**Y**	0.0639	**6.1E+00**
TCL PAHs																		
Acenaphthene	83-32-9	4.99E+00	2.50E+01	0.14	4.6E+00	6.4E-01	4.1E+00	5.8E-01	1.0E+00	1.4E-01	Plant	9.3E+00	4.7E+01	1.5E-02	3.0E-03	N	--	--
Acenaphthylene	208-96-8	5.27E+01	2.64E+02	0.12	4.6E+00	5.5E-01	2.0E+01	2.5E+00	1.0E+00	1.2E-01	Invertebrate	2.2E+01	1.1E+02	5.4E-03	1.1E-03	N	--	--
Benzo(a)anthracene	56-55-3	8.74E-02	8.74E-01	0.036	5.4E-01	1.9E-02	1.7E+00	6.1E-02	1.0E+00	3.6E-02	Invertebrate	4.4E-01	4.4E+00	8.2E-02	8.2E-03	N	--	--
Benzo(a)pyrene	50-32-8	2.85E-01	2.85E+00	0.02	3.3E+00	6.6E-02	1.9E+00	3.8E-02	1.0E+00	2.0E-02	Plant	7.4E-01	7.4E+00	2.7E-02	2.7E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	2.85E-01	2.85E+00	0.015	4.8E-01	7.2E-03	3.5E+00	5.2E-02	1.0E+00	1.5E-02	Invertebrate	7.0E-01	7.0E+00	2.1E-02	2.1E-03	N	--	--
Benzo(k)fluoranthene	207-08-9	3.15E+00	3.15E+01	0.017	1.0E+00	1.7E-02	2.7E+00	4.5E-02	1.0E+00	1.7E-02	Invertebrate	1.0E+01	1.0E+02	1.7E-03	1.7E-04	N	--	--
Chrysene	218-01-9	4.32E+00	4.32E+01	0.054	1.1E+00	5.7E-02	2.5E+00	1.3E-01	1.0E+00	5.4E-02	Invertebrate	1.5E+01	1.5E+02	3.6E-03	3.6E-04	N	--	--
Fluoranthene	206-44-0	8.74E+00	4.37E+01	0.2345	6.0E+00	1.4E+00	6.5E+00	1.5E+00	1.0E+00	2.3E-01	Invertebrate	1.1E+01	5.7E+01	2.0E-02	4.1E-03	N	--	--
Phenanthrene	85-01-8	2.00E+00	9.98E+00	0.067	1.1E+01	7.4E-01	1.6E+00	1.1E-01	1.0E+00	6.7E-02	Plant	1.6E+00	7.8E+00	4.3E-02	8.6E-03	N	--	--
Pyrene	129-00-0	2.28E+00	1.14E+01	0.0215	3.7E+00	8.0E-02	5.6E+00	1.2E-01	1.0E+00	2.2E-02	Invertebrate	3.5E+00	1.7E+01	6.2E-03	1.2E-03	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Red FoxSpecific Data from Table F.3-9

BW=	2.9500	kg
IR_{food} =	0.342	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00960	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Screening Level

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Screening Level

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.3-19
Refined Wildlife Risk Characterization - Red Fox
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment										
				Soil										
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics														
Arsenic	7440-38-2	3.59E-02	3.59E-01	14.24	3.8E-02	5.3E-01	1.1E-01	1.6E+00	4.9E-03	6.9E-02	1.9E+03	1.9E+04	7.5E-03	7.5E-04
Cadmium	7440-43-9	5.07E-01	5.07E+00	0.22	1.2E+00	2.7E-01	1.1E+01	2.5E+00	6.4E-01	1.4E-01	9.6E+02	9.6E+03	2.3E-04	2.3E-05
Chromium	7440-47-3	1.73E+00	1.73E+01	31.0	4.1E-02	1.3E+00	3.1E-01	9.5E+00	9.3E-02	2.9E+00	3.2E+04	3.2E+05	9.6E-04	9.6E-05
Lead	7439-92-1	4.22E+00	4.22E+01	241	2.4E-02	5.8E+00	2.8E-01	6.7E+01	5.1E-02	1.2E+01	1.1E+05	1.1E+06	2.1E-03	2.1E-04
Selenium	7782-49-2	1.05E-01	1.74E-01	0.76	4.9E-01	3.8E-01	1.0E+00	7.6E-01	7.8E-01	6.0E-01	3.1E+02	5.1E+02	2.5E-03	1.5E-03
Zinc	7440-66-6	8.44E+01	1.69E+02	106	6.0E-01	6.4E+01	3.7E+00	4.0E+02	1.0E+00	1.1E+02	1.8E+05	3.5E+05	6.1E-04	3.0E-04
Dioxin/Furans														
Total 2,3,7,8-TCDD Equivalents	1746-01-6	2.85E-07	2.85E-06	9.59E-06	6.5E-03	6.2E-08	1.1E+01	1.1E-04	7.2E-01	6.9E-06	6.2E-04	6.2E-03	1.5E-02	1.5E-03
Pesticides/PCBs														
Aroclor 1254	11097-69-1	1.94E-02	1.94E-01	0.39	6.8E-03	2.6E-03	6.7E+00	2.6E+00	1.0E+00	3.9E-01	4.0E+01	4.0E+02	9.5E-03	9.5E-04
Aroclor 1260	11096-82-5	1.94E-02	1.94E-01	0.06	4.5E-03	2.9E-04	6.7E+00	4.3E-01	1.0E+00	6.4E-02	4.0E+01	4.0E+02	1.6E-03	1.6E-04

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Red FoxSpecific Data from Table F.3-9

BW=	4.5300	kg
IR_{food} =	0.238	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.17	unitless
DF_{inv} =	0.04	unitless
DF_{mam} =	0.79	unitless
IR_{soil} =	0.00670	kg dw/day
AF =	0.0084	unitless

Table F.3-20
Preliminary Wildlife Risk Characterization - American Robin
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																
Arsenic	7440-38-2	5.14E+00	1.28E+01	16.1	1.1E+00	1.8E+01	5.2E-01	8.4E+00	Plant	1.4E+01	3.5E+01	**1.1E+00**	4.6E-01	**Y**	14.24	**1.0E+00**
Cadmium	7440-43-9	1.45E+00	2.00E+01	0.31	3.3E+00	1.0E+00	4.1E+01	1.3E+01	Invertebrate	1.1E-01	1.6E+00	**2.7E+00**	2.0E-01	**Y**	0.217	**1.9E+00**
Chromium	7440-47-3	1.00E+00	5.00E+00	47	8.4E-02	3.9E+00	3.2E+00	1.5E+02	Invertebrate	9.9E-01	4.9E+00	**4.8E+01**	**9.5E+00**	**Y**	30.95	**3.1E+01**
Copper	7440-50-8	4.70E+01	6.17E+01	40	6.3E-01	2.5E+01	1.5E+00	6.1E+01	Invertebrate	9.4E+01	1.2E+02	4.2E-01	3.2E-01	N	--	--
Lead	7439-92-1	1.13E+00	1.13E+01	366	4.7E-01	1.7E+02	1.5E+00	5.6E+02	Invertebrate	2.3E+00	2.3E+01	**1.6E+02**	**1.6E+01**	**Y**	241.3	**1.1E+02**
Mercury	7439-97-6	4.50E-01	9.00E-01	0.49	5.0E+00	2.5E+00	2.1E+01	1.0E+01	Invertebrate	6.9E-02	1.4E-01	**7.1E+00**	**3.5E+00**	**Y**	0.289	**4.2E+00**
Nickel	7440-02-0	7.74E+01	1.07E+02	33	1.4E+00	4.7E+01	4.7E+00	1.6E+02	Invertebrate	5.1E+01	7.1E+01	6.4E-01	4.6E-01	N	--	--
Selenium	7782-49-2	4.00E-01	8.00E-01	1.1	3.0E+00	3.3E+00	1.3E+00	1.5E+00	Plant	4.1E-01	8.3E-01	**2.7E+00**	**1.3E+00**	**Y**	0.764	**1.8E+00**
Silver	7440-22-4	1.66E+01	1.24E+02	2.1	3.7E-02	7.8E-02	1.5E+01	3.2E+01	Invertebrate	3.4E+00	2.6E+01	6.1E-01	8.2E-02	N	--	--
Zinc	7440-66-6	1.45E+01	1.31E+02	152	1.8E+00	2.8E+02	1.3E+01	2.0E+03	Invertebrate	3.6E+00	3.2E+01	**4.3E+01**	**4.7E+00**	**Y**	106.4	**3.0E+01**
Dioxin/Furans																
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	3.33E-06	7.5E-03	2.5E-08	2.2E+01	7.4E-05	Invertebrate	2.0E-06	2.0E-05	**1.7E+00**	1.7E-01	**Y**	1.16E-05	**5.8E+00**
Pesticides/PCBs																
Aldrin	309-00-2	NV	NV	0.00105	--	--	--	--	--	--	--	**--**	**--**	N	--	--
beta-BHC	319-85-7	5.60E-01	2.25E+00	0.0055	1.0E+00	5.5E-03	2.9E+00	1.6E-02	Invertebrate	6.1E-01	2.4E+00	9.0E-03	2.3E-03	N	--	--
gamma-BHC (Lindane)	58-89-9	2.00E+00	2.00E+01	0.00099	1.0E+00	9.9E-04	1.3E+01	1.3E-02	Invertebrate	5.0E-01	5.0E+00	2.0E-03	2.0E-04	N	--	--
Aroclor 1254	11097-69-1	4.10E-01	4.10E+00	0.46	6.8E-03	3.1E-03	1.6E+01	7.3E+00	Invertebrate	8.2E-02	8.2E-01	**5.6E+00**	5.6E-01	**Y**	0.385	**4.7E+00**
Aroclor 1260	11096-82-5	4.10E-01	4.10E+00	0.092	4.5E-03	4.2E-04	1.6E+01	1.5E+00	Invertebrate	8.2E-02	8.2E-01	**1.1E+00**	1.1E-01	**Y**	0.0639	7.8E-01
TCL PAHs																
Acenaphthene	83-32-9	1.01E+00	5.05E+00	0.14	4.6E+00	6.4E-01	4.1E+00	5.8E-01	Plant	6.9E-01	3.4E+00	2.0E-01	4.1E-02	N	--	--
Acenaphthylene	208-96-8	NV	NV	0.12	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Benzo(a)anthracene	56-55-3	NV	NV	0.036	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Benzo(a)pyrene	50-32-8	5.00E-01	2.50E+00	0.02	3.3E+00	6.6E-02	1.9E+00	3.8E-02	Plant	4.7E-01	2.4E+00	4.2E-02	8.4E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	NV	NV	0.015	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Benzo(k)fluoranthene	207-08-9	NV	NV	0.017	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Chrysene	218-01-9	NV	NV	0.054	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Fluoranthene	206-44-0	NV	NV	0.2345	--	--	--	--	--	--	--	**--**	**--**	N	--	--
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.067	1.1E+01	7.4E-01	1.6E+00	1.1E-01	Plant	3.2E-01	1.6E+00	2.1E-01	4.1E-02	N	--	--
Pyrene	129-00-0	NV	NV	0.0215	--	--	--	--	--	--	--	**--**	**--**	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

American Robin Specific Data from Table F.3-9

BW=	0.0635	kg
IR_{food} =	0.020	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00100	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.3-21
Refined Wildlife Risk Characterization - American Robin
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment								
				Soil								
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics												
Arsenic	7440-38-2	5.14E+00	1.28E+01	14.24	3.8E-02	5.3E-01	1.1E-01	1.6E+00	2.2E+02	5.4E+02	6.6E-02	2.6E-02
Cadmium	7440-43-9	1.45E+00	2.00E+01	0.217	1.2E+00	2.7E-01	1.1E+01	2.5E+00	1.4E+00	1.9E+01	1.6E-01	1.2E-02
Chromium	7440-47-3	1.00E+00	5.00E+00	30.95	4.1E-02	1.3E+00	3.1E-01	9.5E+00	2.5E+01	1.3E+02	**1.2E+00**	2.5E-01
Lead	7439-92-1	1.13E+00	1.13E+01	241.3	2.4E-02	5.8E+00	2.8E-01	6.7E+01	3.2E+01	3.2E+02	**7.5E+00**	7.5E-01
Mercury	7439-97-6	4.50E-01	9.00E-01	0.289	6.5E-01	1.9E-01	1.7E+00	4.9E-01	2.0E+00	4.0E+00	1.5E-01	7.3E-02
Selenium	7782-49-2	4.00E-01	8.00E-01	0.764	4.9E-01	3.8E-01	1.0E+00	7.6E-01	2.6E+00	5.3E+00	2.9E-01	1.5E-01
Zinc	7440-66-6	1.45E+01	1.31E+02	106.4	6.0E-01	6.4E+01	3.7E+00	4.0E+02	3.8E+01	3.4E+02	**2.8E+00**	3.1E-01
Dioxin/Furans												
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	1.16E-05	6.5E-03	7.6E-08	1.1E+01	1.3E-04	1.6E-05	1.6E-04	7.3E-01	7.3E-02
Pesticides/PCBs												
Aroclor 1254	11097-69-1	4.10E-01	4.10E+00	0.385	6.8E-03	2.6E-03	6.7E+00	2.6E+00	7.7E-01	7.7E+00	5.0E-01	5.0E-02
Aroclor 1260	11096-82-5	4.10E-01	4.10E+00	0.0639	4.5E-03	2.9E-04	6.7E+00	4.3E-01	7.7E-01	7.7E+00	8.3E-02	8.3E-03

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

American Robin Specific Data from Table F.3-9

BW=	0.0773	kg
IR_{food} =	0.016	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.62	unitless
DF_{inv} =	0.38	unitless
IR_{soil} =	0.0008	kg dw/day
AF =	1.000	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.3-22
Preliminary Wildlife Risk Characterization - Red-tailed Hawk
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment									
				Soil									
				Maximum Detected Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics													
Arsenic	7440-38-2	5.14E+00	1.28E+01	16.1	1.5E-02	2.4E-01	5.2E+03	2.1E+03	3.1E-03	1.2E-03	N	--	--
Cadmium	7440-43-9	1.45E+00	2.00E+01	0.31	4.0E+00	1.2E+00	5.5E+00	4.0E-01	5.6E-02	4.1E-03	N	--	--
Chromium	7440-47-3	1.00E+00	5.00E+00	47	3.3E-01	1.6E+01	4.6E+01	9.1E+00	1.0E+00	2.0E-01	N	--	--
Copper	7440-50-8	4.70E+01	6.17E+01	40	1.0E+00	4.2E+01	6.8E+02	5.2E+02	5.9E-02	4.5E-02	N	--	--
Lead	7439-92-1	1.13E+00	1.13E+01	366	2.9E-01	1.0E+02	6.0E+01	6.0E+00	**6.1E+00**	6.1E-01	**Y**	241.3	**4.0E+00**
Mercury	7439-97-6	4.50E-01	9.00E-01	0.49	1.9E-01	9.4E-02	3.6E+01	1.8E+01	1.4E-02	6.9E-03	N	--	--
Nickel	7440-02-0	7.74E+01	1.07E+02	33	5.9E-01	1.9E+01	2.0E+03	1.4E+03	1.7E-02	1.2E-02	N	--	--
Selenium	7782-49-2	4.00E-01	8.00E-01	1.1	1.2E+00	1.3E+00	5.1E+00	2.6E+00	2.1E-01	1.1E-01	N	--	--
Silver	7440-22-4	1.66E+01	1.24E+02	2.1	5.0E-01	1.1E+00	5.0E+02	6.7E+01	4.2E-03	5.6E-04	N	--	--
Zinc	7440-66-6	1.45E+01	1.31E+02	152	2.7E+00	4.1E+02	8.2E+01	9.1E+00	**1.9E+00**	2.1E-01	**Y**	106.4	**1.3E+00**
Dioxin/Furans													
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	3.33E-06	2.2E+00	7.3E-06	9.7E-05	9.7E-06	3.4E-02	3.4E-03	N	--	--
Pesticides/PCBs													
Aldrin	309-00-2	NV	NV	0.00105	--	--	--	--	**--**	**--**	N	--	--
beta-BHC	319-85-7	5.60E-01	2.25E+00	0.0055	1.0E+00	5.5E-03	8.5E+00	2.1E+00	6.5E-04	1.6E-04	N	--	--
gamma-BHC (Lindane)	58-89-9	2.00E+00	2.00E+01	0.00099	1.0E+00	9.9E-04	3.0E+01	3.0E+00	3.3E-05	3.3E-06	N	--	--
Aroclor 1254	11097-69-1	4.10E-01	4.10E+00	0.46	1.0E+00	4.6E-01	6.2E+00	6.2E-01	7.4E-02	7.4E-03	N	--	--
Aroclor 1260	11096-82-5	4.10E-01	4.10E+00	0.092	1.0E+00	9.2E-02	6.2E+00	6.2E-01	1.5E-02	1.5E-03	N	--	--
TCL PAHs													
Acenaphthene	83-32-9	1.01E+00	5.05E+00	0.14	1.0E+00	1.4E-01	1.5E+01	3.1E+00	9.1E-03	1.8E-03	N	--	--
Acenaphthylene	208-96-8	NV	NV	0.12	--	--	--	--	**--**	**--**	N	--	--
Benzo(a)anthracene	56-55-3	NV	NV	0.036	--	--	--	--	**--**	**--**	N	--	--
Benzo(a)pyrene	50-32-8	5.00E-01	2.50E+00	0.02	1.0E+00	2.0E-02	7.6E+00	1.5E+00	2.6E-03	5.3E-04	N	--	--
Benzo(b)fluoranthene	205-99-2	NV	NV	0.015	--	--	--	--	**--**	**--**	N	--	--
Benzo(k)fluoranthene	207-08-9	NV	NV	0.017	--	--	--	--	**--**	**--**	N	--	--
Chrysene	218-01-9	NV	NV	0.054	--	--	--	--	**--**	**--**	N	--	--
Fluoranthene	206-44-0	NV	NV	0.2345	--	--	--	--	**--**	**--**	N	--	--
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.067	1.0E+00	6.7E-02	1.7E+01	3.4E+00	3.9E-03	7.8E-04	N	--	--
Pyrene	129-00-0	NV	NV	0.0215	--	--	--	--	**--**	**--**	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW_i = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Red-tailed Hawk Specific Data from Table F.3-9

BW=	0.957	kg
IR_{food} =	0.063	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{mam} =	1.00	unitless
IR_{soil} =	0.00	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screenning levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.3-23
Refined Wildlife Risk Characterization - Red-tailed Hawk
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment						
				Soil						
				EPC (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Soil Screening Level[a] (mg/kg)	Calculated LOAEL-Based Soil Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics										
Lead	7439-92-1	1.13E+00	1.13E+01	241.3	5.1E-02	1.2E+01	1.3E+05	1.3E+06	1.8E-03	1.8E-04
Zinc	7440-66-6	1.45E+01	1.31E+02	106.4	1.0E+00	1.1E+02	8.4E+04	7.6E+05	1.3E-03	1.4E-04

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10
BW = Average Body Weigth of Receptor (kg)
IR_{food} = Average Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor, specific to prey type and chemical
DF = Dietary fraction
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
BDL = Below Detection Limit
EPC = Exposure Point Concentration

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level
LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Red-tailed Hawk Specific Data from Table F.3-9

BW=	1.134	kg
IR_{food} =	0.059	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{mam} =	1.00	unitless
IR_{soil} =	0.0	kg dw/day
AF =	0.0032	unitless

Table F.3-24
Wildlife Summary
Screening Level Ecological Risk Assessment - SWMU 71
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS#	Meadow Vole					Short-tailed Shrew					Red Fox					American Robin					Red-tailed Hawk				
		Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ
Inorganics																										
Arsenic	7440-38-2	**8.9E+01**	**8.9E+00**	**7.9E+01**	**1.6E+00**	1.6E-01	**3.1E+01**	**3.1E+00**	**2.8E+01**	**2.6E+00**	2.6E-01	**5.9E+01**	**5.9E+00**	**5.2E+01**	7.5E-03	7.5E-04	**1.1E+00**	4.6E-01	**1.0E+00**	6.6E-02	2.6E-02	3.1E-03	1.2E-03	NC	NC	NC
Cadmium	7440-43-9	3.5E-01	3.5E-02	NC	NC	NC	**1.4E+00**	1.4E-01	**1.0E+00**	1.4E-01	1.4E-02	**2.9E+00**	2.9E-01	**2.0E+00**	2.3E-04	2.3E-05	**2.7E+00**	2.0E-01	**1.9E+00**	1.6E-01	1.2E-02	5.6E-02	4.1E-03	NC	NC	NC
Chromium	7440-47-3	5.2E-01	5.2E-02	NC	NC	NC	**5.1E+00**	5.1E-01	**3.4E+00**	2.1E-01	2.1E-02	**1.0E+01**	**1.0E+00**	**6.6E+00**	9.6E-04	9.6E-05	**4.8E+01**	**9.5E+00**	**3.1E+01**	**1.2E+00**	2.5E-01	1.0E+00	2.0E-01	NC	NC	NC
Copper	7440-50-8	5.7E-01	4.3E-01	NC	NC	NC	4.7E-01	3.6E-01	NC	NC	NC	9.0E-01	6.8E-01	NC	NC	NC	4.2E-01	3.2E-01	NC	NC	NC	5.9E-02	4.5E-02	NC	NC	NC
Lead	7439-92-1	**7.5E+00**	7.5E-01	**5.0E+00**	1.8E-01	1.8E-02	**8.1E+00**	8.1E-01	**5.4E+00**	6.4E-01	6.4E-02	**1.6E+01**	**1.6E+00**	**1.0E+01**	2.1E-03	2.1E-04	**1.6E+02**	**1.6E+01**	**1.1E+02**	**7.5E+00**	7.5E-01	**6.1E+00**	6.1E-01	**4.0E+00**	1.8E-03	1.8E-04
Mercury	7439-97-6	4.8E-02	4.8E-03	NC	NC	NC	6.5E-02	6.5E-03	NC	NC	NC	1.3E-01	1.3E-02	NC	NC	NC	**7.1E+00**	**3.5E+00**	**4.2E+00**	1.5E-01	7.3E-02	1.4E-02	6.9E-03	NC	NC	NC
Nickel	7440-02-0	4.0E-01	2.0E-01	NC	NC	NC	4.4E-01	2.2E-01	NC	NC	NC	8.6E-01	4.3E-01	NC	NC	NC	6.4E-01	4.6E-01	NC	NC	NC	1.7E-02	1.2E-02	NC	NC	NC
Selenium	7782-49-2	**5.6E+00**	**3.4E+00**	**3.9E+00**	2.4E-01	1.5E-01	**1.9E+00**	**1.1E+00**	**1.3E+00**	2.4E-01	1.4E-01	**3.7E+00**	**2.2E+00**	**2.6E+00**	2.5E-03	1.5E-03	**2.7E+00**	**1.3E+00**	**1.8E+00**	2.9E-01	1.5E-01	2.1E-01	1.1E-01	NC	NC	NC
Silver	7440-22-4	1.9E-03	1.9E-04	NC	NC	NC	1.6E-01	1.6E-02	NC	NC	NC	3.2E-01	3.2E-02	NC	NC	NC	6.1E-01	8.2E-02	NC	NC	NC	4.2E-03	5.6E-04	NC	NC	NC
Zinc	7440-66-6	5.9E-01	2.9E-01	NC	NC	NC	**1.3E+00**	6.7E-01	9.4E-01	1.4E-01	6.8E-02	**2.7E+00**	**1.3E+00**	**1.9E+00**	6.1E-04	3.0E-04	**4.3E+01**	**4.7E+00**	**3.0E+01**	**2.8E+00**	3.1E-01	**1.9E+00**	2.1E-01	**1.3E+00**	1.3E-03	1.4E-04
Dioxin/Furans																										
Total 2,3,7,8-TCDD Equivalents	1746-01-6	7.0E-02	7.0E-03	NC	NC	NC	**1.6E+01**	**1.6E+00**	**4.3E+01**	**1.0E+01**	1.0E+00	**3.2E+01**	**3.2E+00**	**8.7E+01**	1.5E-02	1.5E-03	**1.7E+00**	1.7E-01	**5.8E+00**	7.3E-01	7.3E-02	3.4E-02	3.4E-03	NC	NC	NC
Pesticides/PCBs																										
Aldrin	309-00-2	1.8E-03	3.6E-04	NC	NC	NC	2.0E-03	3.9E-04	NC	NC	NC	3.8E-03	7.7E-04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
beta-BHC	319-85-7	4.7E-03	9.4E-04	NC	NC	NC	4.5E-03	8.9E-04	NC	NC	NC	8.8E-03	1.8E-03	NC	NC	NC	9.0E-03	2.3E-03	NC	NC	NC	6.5E-04	1.6E-04	NC	NC	NC
gamma-BHC (Lindane)	58-89-9	4.3E-05	4.3E-06	NC	NC	NC	1.7E-04	1.7E-05	NC	NC	NC	3.5E-04	3.5E-05	NC	NC	NC	2.0E-03	2.0E-04	NC	NC	NC	3.3E-05	3.3E-06	NC	NC	NC
Aroclor 1254	11097-69-1	1.3E-01	1.3E-02	NC	NC	NC	**2.2E+01**	**2.2E+00**	**1.8E+01**	**3.7E+00**	3.7E-01	**4.4E+01**	**4.4E+00**	**3.7E+01**	9.5E-03	9.5E-04	**5.6E+00**	5.6E-01	**4.7E+00**	5.0E-01	5.0E-02	7.4E-02	7.4E-03	NC	NC	NC
Aroclor 1260	11096-82-5	2.4E-02	2.4E-03	NC	NC	NC	**4.4E+00**	4.4E-01	**3.0E+00**	6.2E-01	6.2E-02	**8.8E+00**	8.8E-01	**6.1E+00**	1.6E-03	1.6E-04	**1.1E+00**	1.1E-01	7.8E-01	8.3E-02	8.3E-03	1.5E-02	1.5E-03	NC	NC	NC
TCL PAHs																										
Acenaphthene	83-32-9	2.3E-02	4.6E-03	NC	NC	NC	7.6E-03	1.5E-03	NC	NC	NC	1.5E-02	3.0E-03	NC	NC	NC	2.0E-01	4.1E-02	NC	NC	NC	9.1E-03	1.8E-03	NC	NC	NC
Acenaphthylene	208-96-8	1.9E-03	3.7E-04	NC	NC	NC	2.7E-03	5.4E-04	NC	NC	NC	5.4E-03	1.1E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(a)anthracene	56-55-3	4.1E-02	4.1E-03	NC	NC	NC	4.3E-02	4.3E-03	NC	NC	NC	8.2E-02	8.2E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(a)pyrene	50-32-8	4.1E-02	4.1E-03	NC	NC	NC	1.4E-02	1.4E-03	NC	NC	NC	2.7E-02	2.7E-03	NC	NC	NC	4.2E-02	8.4E-03	NC	NC	NC	2.6E-03	5.3E-04	NC	NC	NC
Benzo(b)fluoranthene	205-99-2	4.7E-03	4.7E-04	NC	NC	NC	1.1E-02	1.1E-03	NC	NC	NC	2.1E-02	2.1E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(k)fluoranthene	207-08-9	9.8E-04	9.8E-05	NC	NC	NC	8.6E-04	8.6E-05	NC	NC	NC	1.7E-03	1.7E-04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chrysene	218-01-9	2.4E-03	2.4E-04	NC	NC	NC	1.8E-03	1.8E-04	NC	NC	NC	3.6E-03	3.6E-04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoranthene	206-44-0	2.9E-02	5.7E-03	NC	NC	NC	1.0E-02	2.1E-03	NC	NC	NC	2.0E-02	4.1E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Phenanthrene	85-01-8	6.5E-02	1.3E-02	NC	NC	NC	2.1E-02	4.3E-03	NC	NC	NC	4.3E-02	8.6E-03	NC	NC	NC	2.1E-01	4.1E-02	NC	NC	NC	3.9E-03	7.8E-04	NC	NC	NC
Pyrene	129-00-0	6.2E-03	1.2E-03	NC	NC	NC	3.1E-03	6.2E-04	NC	NC	NC	6.2E-03	1.2E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
CAS = Chemical Abstract Services
NC = Not Calculated
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
HQ = Hazard Quotient
EPC = Exposure Point Concentration

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APPENDIX F.4

THREATENED AND ENDANGERED SPECIES CORRESPONDENCE

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URS

March 21, 2003

Ms. René Hypes, Project Review Coordinator
Division of Natural Heritage
Virginia Department of Conservation and Recreation
217 Governor Street
Richmond, VA 23219

Subject: Natural Heritage Project Review

Dear Ms. Hypes:

I am writing to request information concerning threatened and endangered species potentially inhabiting the area in the vicinity of an industrial site located near the town of Radford, VA. URS is performing an ecological risk assessment of the site.

The site is located in the Valley and Ridge Province in western Montgomery County, VA. Land use surrounding the site is largely undeveloped due to steep terrain, although less rugged areas are primarily used for agriculture.

A portion of a topographic map (Radford North,VA quad) is attached which specifies the location of the site. Please perform a search of the area within a one-mile radius of this location and notify us of any threatened or endangered species and/or critical or protected habitats known to occur in this vicinity.

If you should have any questions concerning this request, please contact me at 215-542-3800. I thank you for your assistance in this matter.

Sincerely,

Gary R. Long
Staff Biologist

Enclosures(2)

URS Corporation
1400 Union Meeting Road, Suite 202
Blue Bell, PA 19422-1972
Tel: 215.542.3800
Fax: 215.542.3888

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street
Richmond, Virginia 23219-2010
Telephone (804) 786-7951 FAX (804) 371-2674 TDD (804) 786-2121

April 10, 2003

Gary Long
URS
1400 Union Meeting Road, Suite 202
Blue Bell, PA 19422-1972

Re: Industrial Site, Valley and Ridge in western Montgomery County

Dear Mr. Long:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biological and Conservation Data System (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the topographic map, this project either overlies or is adjacent to a karst landscape characterized by sinkholes, caves, disappearing streams, and large springs. The project has been sent to the Virginia Karst Program and to the Virginia Speleological Survey for review for documented sensitive karst features and caves. A significant cave has been documented in the project vicinity. Please coordinate with the Virginia Karst Program at 540-831-4056 (worndorff@dcr.state.va.us) to avoid, minimize, or mitigate impacts.

Our files also do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to BCD. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of $ 95.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, Department of Conservation and Recreation, 203 Governor Street, Suite 414, Richmond, VA 23219, ATTN: Cashier. Payment is due within thirty days of the invoice date.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

S. René Hypes
Project Review Coordinator

CC: Wil Orndorff, DCR

Natural Heritage Resources by County

Your Search Criteria:
Montgomery, Pulaski County(ies)
Federal Legal Status: All,
State Legal Status: All,
Search run: 04-09-2003

See Map

On the map page, set page orientation to landscape to print map.
Click highlighted scientific names below to go to NatureServe report.

Search Menu

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Last Year Observed
Montgomery						
AMPHIBIANS						
Cryptobranchus alleganiensis	Hellbender	G3G4	S2S3		SC	1979
BIRDS						
Thryomanes bewickii altus	Appalachian bewick's wren	G5T2Q	S1B,SZN	SOC	LE	
BIVALVIA (MUSSELS)						
Lasmigona subviridis	Green floater	G3	S2		SC	1981
CRUSTACEA (AMPHIPODS, ISOPODS & DECAPODS)						
Caecidotea vandeli	Vandel's cave isopod	G2G3	S1S2	SOC		1969
Stygobromus estesi	Craig county cave amphipod	G1G2	S1S2	SOC		1999
Stygobromus fergusoni	Montgomery county cave amphipod	G1G2	S1	SOC		1969
DIPLOPODA (MILLIPEDES)						
Pseudotremia cavernarum	Ellett valley pseudotremia millipede	G2G4	S1		LT	ND
DIPLURA (DIPLURANS)						
Litocampa sp 3	A cave dipluran	G2	S2	SOC		1971

FISH						
Noturus gilberti	Orangefin madtom	G2	S2	SOC	LT	1989
Percina rex	Roanoke logperch	G1G2	S1S2	LE	LE	1986
LEPIDOPTERA (BUTTERFLIES & MOTHS)						
Apamea smythi	Smyth's apamea moth	GH	SH	SOC		1907
Atrytone arogos arogos	Arogos skipper	G3G4T1T2	SH	SOC		ND-
Erynnis persius persius	Persius duskywing	G5T2T3	S1	SOC		1974
Pyrgus wyandot	Appalachian grizzled skipper	G2	S1S2	SOC		1974
MAMMALS						
Myotis sodalis	Indiana bat	G2	S1	LE	LE	1947
PLECOPTERA (STONEFLIES)						
Allocapnia simmonsi	Spatulate snowfly	G2	S1S2	SOC		1982
VASCULAR PLANTS						
Buckleya distichophylla	Piratebush	G2	S2	SOC	LE	1996
Clematis addisonii	Addison's leatherflower	G2	S2	SOC		2001
Echinacea laevigata	Smooth coneflower	G2	S2	LE		2001
Paxistima canbyi	Canby's mountain-lover	G2	S2	SOC		1993
Phlox buckleyi	Sword-leaved phlox	G2	S2	SOC		1992
Rudbeckia triloba var pinnatiloba	Pinnate-lobed black-eyed susan	G4G5T2?	S1	SOC		1993

Pulaski

AMPHIBIANS						
Cryptobranchus alleganiensis	Hellbender	G3G4	S2S3		SC	1948
BIRDS						
Ammodramus henslowii	Henslow's sparrow	G4	S1B		LT	2000
COLEOPTERA (BEETLES)						
Pseudanophthalmus sp 7	A cave beetle	G1	S1	SOC		1980
CRUSTACEA (AMPHIPODS, ISOPODS & DECAPODS)						
Caecidotea henroti	Henrot's cave isopod	G2G3	S1S2	SOC		1978
Stygobromus abditus	James cave amphipod	G2	S2	SOC		1999
DIPLURA (DIPLURANS)						
Litocampa sp 3	A cave dipluran	G2	S2	SOC		1979

FISH						
Etheostoma osburni	Candy darter	G3	S1		SC	ND
GASTROPODA (SNAILS)						
Glyphyalinia raderi	Maryland glyph	G2	S1S2	SOC	SC	ND
Polygyriscus virginianus	Virginia fringed mountain snail	G1	S1	LE	LE	1989
VASCULAR PLANTS						
Buckleya distichophylla	Piratebush	G2	S2	SOC	LE	1987
Echinacea laevigata	Smooth coneflower	G2	S2	LE		2001
Paxistima canbyi	Canby's mountain-lover	G2	S2	SOC		1991
Phlox buckleyi	Sword-leaved phlox	G2	S2	SOC		1986

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

Need Additional Information? For more detailed information on locations of Natural Heritage Resources submit an information request.

Want to Contribute? If you have information on locations of natural heritage resources, please fill out and submit a rare species sighting form

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Return to the Online Information page

URS

March 21, 2003

Ms. Roberta Hylton
Project Leader, Southwest Virginia Field Office
U.S. Fish and Wildlife Service
330 Cummings Street
Abingdon, VA 24210

Subject: Threatened and Endangered Species Review

Dear Ms. Hylton:

I am writing to request information concerning threatened and endangered species potentially inhabiting the area in the vicinity of an industrial site located near the town of Radford, VA. URS is performing an ecological risk assessment of the site.

The site is located in the Valley and Ridge Province in western Montgomery County, VA. Land use surrounding the site is largely undeveloped due to steep terrain, although less rugged areas are primarily used for agriculture.

A portion of a topographic map (Radford North,VA quad) is attached which specifies the location of the site. Please perform a search of the area within a one-mile radius of this location and notify us of any threatened or endangered species and/or critical or protected habitats known to occur in this vicinity.

If you should have any questions concerning this request, please contact me at 215-542-3800. I thank you for your assistance in this matter.

Sincerely,

Gary R. Long
Staff Biologist

Enclosure

URS Corporation
1400 Union Meeting Road, Suite 202
Blue Bell, PA 19422-1972
Tel: 215.542.3800
Fax: 215.542.3888

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061

April 21, 2003

Mr. Gary R. Long
URS Corporation
1400 Union Meeting Road, Suite 202
Blue Bell, Pennsylvania 19422-1972

Re: Project #2918

Greetings:

The U.S. Fish and Wildlife Service (Service) has received your request to review the attached project for potential impacts to Federally listed or proposed endangered and threatened species and designated critical habitat in Virginia pursuant to the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). Attached is a list of species with Federal status and species of concern that have been documented or may occur in the county where your project is located. This list was prepared by this office and is based on information obtained from previous surveys for rare and endangered species.

In order to ensure coordination with the State agencies, we consistently recommend that individuals contact the Virginia Department of Conservation and Recreation, Division of Natural Heritage **and** the Virginia Department of Game and Inland Fisheries, since each agency maintains a different database and has differing expertise and/or regulatory responsibility. You can contact these agencies at the following addresses:

Virginia Department of Game and Inland Fisheries
Environmental Services Section
P.O. Box 11104
Richmond, VA 23230
(804) 367-1000

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 2nd Floor
Richmond, VA 23219
(804) 786-7951

If either of these agencies determines that your project may impact a Federally listed, proposed, or candidate species OR Federally designated critical habitat, please contact this office and provide a copy of the response letter from each agency and the above referenced project number; otherwise, further contact with this office is not necessary.

If you have any questions or need further assistance, please contact Ms. Jolie Harrison at (804) 693-6694, extension 208.

Sincerely,

Karen L. Mayne

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

KEY

LE - federally listed endangered.

LT - federally listed threatened.

PE - federally proposed endangered.

PT - federally proposed threatened.

EX - believed to be extirpated in Virginia.

LE(S/A) - federally listed endangered due to similarity of appearance to a federally listed species.

LT(S/A) - federally listed threatened due to similarity of appearance to a federally listed species.

C - candidate species; the U.S. Fish and Wildlife Service has enough information to list the species as threatened or endangered, but this action is precluded by other listing activities.

SOC - species of concern; those species that have been identified as potentially imperiled or vulnerable throughout their range or a portion of their range. These species are not protected under the Endangered Species Act.

G - global rank; the species rarity throughout its total range.

G1 - extremely rare and critically imperiled with 5 or fewer occurrences or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.

G2 - very rare and imperiled with 6 to 20 occurrences or few remaining individuals; or because of some factor(s) making it vulnerable to extinction.

G3 - either very rare and local throughout its range or found locally (abundantly at some of its locations) in a restricted range; or vulnerable to extinction because of other factors. Usually fewer than 100 occurrences are documented.

G_T_ - signifies the rank of a subspecies or variety. For example, a G3T1 would apply to a subspecies of a species that is very rare and local throughout its range or found locally in a restricted range (G3) but the subspecies warrants a rank of T1, critically imperiled.

G_Q - The taxon has a questionable taxonomic assignment.

MONTGOMERY COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
FISH		
Percina rex	Roanoke logperch	LE
MAMMALS		
Corynorhinus townsendii virginianus[1]	Virginia big-eared bat	LE
Myotis sodalis[1]	Indiana bat	LE
VASCULAR PLANTS		
Echinacea laevigata	Smooth coneflower	LE

Species of Concern

FISH		
Noturus gilberti	Orangefin madtom	G2
Phenacobius teretulus	Kanawha minnow	G3
Scartomyzon ariommus	Bigeye jumprock	G2
INVERTEBRATES		
Allocapnia simmonsi	Simmons' slender winter stonefly	G2
Atrytone arogos arogos	Arogos skipper	G3G4T1T2
Caecidotea vandeli	Vandel's cave isopod	G2
Catocala dulciola	Sweet underwing	G3
Catocala herodias gerhardi	Herodias underwing	G3T3
Lasmigona holstonia	Tennessee heelsplitter	G2G3
Lasmigona subviridis	Green floater	G3
Pseudanophthalmus pusio	A cave beetle	G3
Pyrgus wyandot	Appalachian grizzled skipper	G2
Speyeria diana	Diana fritillary	G3
Speyeria idalia	Regal fritillary	G3
Stygobromus fergusoni	Montgomery County cave amphipod	G1
VASCULAR PLANTS		
Buckleya distichophylla	Piratebush	G2
Carex schweinitzii	Schweinitz's sedge	G3
Clematis addisonii	Addison's leatherflower	G2
Clematis coactilis	Virginia white-haired leatherflower	G3

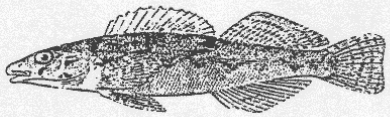
June 25, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

SCIENTIFIC NAME	COMMON NAME	STATUS
Delphinium exaltatum	Tall larkspur	G3
Monotropsis odorata	Sweet pine sap	G3
Paxistima canbyi	Canby's mountain-lover	G2
Phlox buckleyi	Sword-leaved phlox	G2
Poa paludigena[1]	Bog bluegrass	G3

[1]This species has been documented in an adjacent county and may occur in this county.

June 25, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

Roanoke Logperch



D.S. Jordan

Percina rex

Description - The Roanoke logperch is found only in the Roanoke, Nottoway, and Meherrin River systems of Virginia. This small fish can grow up to 4.5 inches in length. Its back is dark green and its sides are greenish to yellowish, both with dark markings; the belly is white to yellowish.

Life History - The logperch typically inhabits medium-to-large, warm, usually clear streams and small rivers of moderate to low gradient. It avoids moderately and heavily silted areas except during winter periods of inactivity. Winter habitat appears to be deep pools under boulders. During warm and mild months, adults usually inhabit the main body of stream pools, runs, and riffles and typically associate with gravel and rubble. Young are usually found in slow runs and pools with clean sandy bottoms. They are rarely found in impoundments. Spawning occurs in April or May in deep runs over gravel and small cobble and logperch typically bury their eggs with no subsequent parental care. This species commonly lives five to six years.

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Logperch actively feed during the warmer months by flipping over stones with their snout and ingesting the exposed prey that consists of bottom-dwelling insects.

Conservation - The Roanoke logperch was listed as an endangered species on August 18, 1989. It appears that massive habitat loss associated with the construction of the large impoundments of the Roanoke River Basin in the 1950s and 1960s (Roanoke Rapids, Gaston, Kerr, Leesville, Smith Mountain, and Philpott Reservoirs) was the original cause of significant population declines of this species. These reservoir systems resulted in major disruptions in the ability of this species to move throughout its historic range. This species presently occurs in five populations in widely separated segments of the upper Roanoke, Pigg, Smith, Nottoway, and Meherrin Rivers. The populations in the Roanoke and Nottoway basins probably represent remnants of much larger populations that once occupied much of the Roanoke and Nottoway River drainage upstream of the fall line. All the populations are small and no genetic exchange occurs among them because they are separated by large impoundments and wide river gaps. Each population is vulnerable because of its relatively low density and limited range. Current threats are nonpoint source pollution and spills and accidents associated with chemical releases and destruction and degradation of habitat. Small logperch populations could go extinct with minor habitat degradation. Water withdrawals may pose a serious threat to the species in the future as the human population of the Roanoke River basin increases.

What You Can Do To Help - If you own property that borders a stream or other waterway, avoid using chemicals or fertilizers. To help control erosion and reduce runoff, maintain a buffer of natural vegetation along the stream bank. Install fencing to prevent livestock from entering the stream, this will reduce siltation and input of waste products.

To find out more about the Roanoke logperch contact:

Virginia Department of Game and Inland Fisheries
P.O. Box 11104
Richmond, Virginia 23230
(804) 367-1000

References

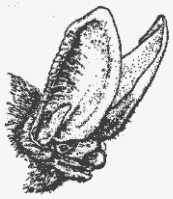
Jenkins, R.E. and N.M. Burkhead. 1993. Freshwater fishes of Virginia. American Fisheries Society, Bethesda, Maryland.

Simonson, T.D. and R.J. Neves. 1986. A status survey of the orangefin madtom and Roanoke logperch. Report to Virginia Commission of Game and Inland Fisheries, Richmond, Virginia.

U.S. Fish and Wildlife Service. 1992. Roanoke logperch (*Percina rex*) recovery plan. Newton Corner, Massachusetts.

Virginia Big-Eared Bat

Corynorhinus townsendii virginianus



J.B. Schulz

Description - The Virginia big-eared bat is only known from a few caves in east-central Kentucky, western North Carolina, western Virginia, and northeastern West Virginia. This medium-sized bat has huge ears, weighs less than 0.5 ounces and is four inches in length from head to toe. It has long brown fur with pale brown underparts.

Life History - The Virginia big-eared bat lives in caves year-round at elevations greater than 1,500 feet above sea level. Although a colony may occupy the same cave throughout the year, it may have one or more roosts in other caves. Individuals move to other roosts even in cold weather. After mating in the fall and winter, the bats search for caves for hibernation. During hibernation males and females hibernate together in cool, well-ventilated portions of caves. These caves are typically located in regions dominated by oak-hickory or beech-maple-hemlock forests. Females congregate in a few maternity caves in summer. Females arrive pregnant and have one young per pregnancy. Young are born around mid-June, and by mid-July they begin to leave the cave at night to forage. Most bats leave the maternity cave by late September. Males are found in caves in summer, scattered singly and in larger numbers. The Virginia big-eared bat feeds mainly on moths.

Conservation - The Virginia big-eared bat was federally listed as an endangered species on November 30, 1979. These bats have declined primarily due to human disturbance and loss of habitat. This species is easily disturbed by human activity including vandalism, caving, and frequent visitation. These disturbances can cause adults to abandon caves, abandon their young, and force them to use valuable energy reserves needed to survive while in hibernation.

What You Can Do To Help - Avoid using pesticides and other chemicals near caves and waterways. Do not enter gated caves or mines. These gates have been installed to protect bats and human safety. Cave habitats are fragile and easily disturbed; if you must enter a cave, do so only as an observer and leave everything as you found it. Never shoot, poison, or otherwise harm bats. Bats are extremely beneficial insect eaters, and nuisance bats can be encouraged to move elsewhere. If you find a bat, please do not disturb it!

Contact one of the following agencies for assistance:

Virginia Department of Game and Inland Fisheries
P.O. Box 11104
Richmond, Virginia 23230
(804) 367-1000

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 3rd Floor
Richmond, Virginia 23219
(804) 786-7951

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694

References

Dalton, V.M. and C.O. Handley, Jr. 1991. Western big-eared. Pages 573-575 in K. Terwilliger, ed. Virginia's Endangered Species Proceedings of a Symposium. McDonald and Woodward Publishing Company, Blacksburg, Virginia.

U.S. Fish and Wildlife Service. 1984. Recovery plan for the Ozark big-eared bat and Virginia big-eared bat. Twin Cities, Minnesota.

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
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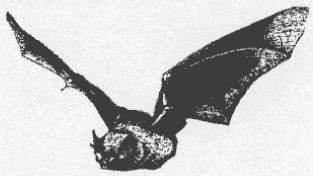
Indiana Bat

Myotis sodalis



Description - The Indiana bat occurs throughout 27 states in the eastern and mid-western U.S. It is found in the western portion of Virginia during hibernation, but seldom found in Virginia during the summer. This medium-sized bat weighs six to nine grams and has an average life span of four years. This short-eared bat is two inches from head to toe and has a wing span of nine to eleven inches. Its fur is dull grayish-brown and the underparts are pinkish.

Life History - After mating in the fall, the Indiana bat travels up to 300 miles to hibernate in large caves and abandoned mines that have stable, cold temperatures during the winter. The fact that the Indiana bats congregate and form large aggregations in only a small percentage of known caves suggests that very few caves meet their requirements. During hibernation they can be found on flat ceilings of caves in clusters containing 500 to 1,000 or more bats. Half of all hibernating Indiana bats winter in Indiana. Hibernation begins in mid-October and ends in April; females are the first to leave. Males roost in caves or mines during the summer. Maternity colonies are located in riparian forests along streams. Females roost together in hollow trees or under loose bark and have one young per pregnancy. The young are born in late June or early July. After one month, young are capable of flight and begin independent feeding. Foraging takes place along forested streams. They feed exclusively on insects.

Conservation - The Indiana bat was federally listed as an endangered species on March 11, 1967. This bat has declined primarily due to human disturbance during hibernation. This species is easily disturbed by human activity such as vandalism, caving, and research during the hibernating months. Other threats are flooding of caves, blockage of cave entrances, and pesticide poisoning.

What You Can Do To Help - Avoid using pesticides and other chemicals near caves and waterways. Do not enter gated caves or mines. These gates have been installed to protect bats and human safety. Cave habitats are fragile and easily disturbed; if you must enter a cave, do so only as an observer and leave everything as you found it. Never shoot, poison, or otherwise harm bats. Bats are extremely beneficial insect eaters, and nuisance bats can be encouraged to move elsewhere. If you find a bat, please do not disturb it!

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December 2000

Contact one of the following agencies for assistance:

Virginia Department of Game and Inland Fisheries
P.O. Box 11104
Richmond, Virginia 23230
(804) 367-1000

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 3rd Floor
Richmond, Virginia 23219
(804) 786-7951

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694

References

Dalton, V.M. and C.O. Handley, Jr. 1991. Social myotis. Pages 569-570 in K.Terwilliger, ed. Virginia's Endangered Species, Proceedings of a Symposium. McDonald and Woodward Publishing Company, Blacksburg, Virginia.

U.S. Fish and Wildlife Service. 1999. Agency Draft: revised draft of the recovery plan for the Indiana bat (*Myotis sodalis*). Fort Snelling, Minnesota.

Smooth Coneflower

Echinacea laevigata

L.W. Zettler

Description - The smooth coneflower occurs in Virginia, North Carolina, South Carolina, and Georgia. It no longer occurs in Pennsylvania. The smooth coneflower is a perennial herb with a single stem that grows up 59 inches in height. Stems are smooth with few leaves. The largest leaves are the elliptical leaves at the base of the plant which can reach a length of 7.8 inches. The petals of the flowers are light pink to purplish, usually drooping, and 1.9 to 3.1 inches in length. Flower heads are usually solitary.

Life History -This rare coneflower was formerly a plant of prairie-like habitats or oak savannahs maintained by fire and large herbivores such as elk and bison. Now, it is found in relatively open areas including dry woods, power line right-of-ways, dry limestone bluffs, roadsides, meadows, and clearcuts. Sites with bare soils rich in magnesium and/or calcium, abundant sunlight, and little competition from other plants are optimal. Flowering occurs from May through July.

Conservation - The smooth coneflower was federally listed as an endangered species on October 8, 1992. Currently, fire or some other suitable form of disturbance, such as well-timed mowing or the careful clearing of trees, is essential to maintaining the habitat remnants upon which this species depends. Loss of open habitat due to conversion to agriculture, silviculture, urbanization, and industrial development, as well as suppression of natural disturbances, such as fire, are a significant threat to this species. Other threats to this species include unauthorized collection, woody plant invasion, residential and industrial development, highway construction and improvement, herbicides, and roadside and power line right-of-way maintenance.

What You Can Do To Help - If you find a plant that appears to be the smooth coneflower, take note of the location and photograph the plant, if possible. Please do not remove the plant! Contact one of the following agencies for assistance:

Virginia Department of Agriculture
and Consumer Services
Office of Plant Protection
P.O. Box 1163
Richmond, Virginia 23209
(804) 786-3515

Virginia Department of Conservation
and Recreation
Division of Natural Heritage
217 Governor Street, 3rd Floor
Richmond, Virginia 23219
(804) 786-7951

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694

References

Gaddy, L.L. 1991. The status of *Echinacea laevigata* (Boynton and Beadle) Blake. Unpublished report to the U.S. Fish and Wildlife Service, Asheville, North Carolina.

Lugwig, J.C. 1991. Smooth coneflower. Pages 144-145 in K. Terwilliger, ed. Virginia's Endangered Species, Proceedings of a Symposium. McDonald and Woodward Publishing Company, Blacksburg, Virginia.

U.S. Fish and Wildlife Service. 1995. Smooth coneflower recovery plan. Atlanta, Georgia.

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http://www.fws.gov
August 1999

APPENDIX G

ANALYTICAL DATA EVALUATION

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APPENDIX G.1

DATA QUALITY OBJECTIVES

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TABLE G.1-1
DATA USABILITY WORKSHEET
SITE: SWMUs 40 and 71
MEDIUM: Soil

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data usability.	There were no problems identified during field sampling that affected data usability.
Are samples representative of receptor exposure for this medium (e.g., sample depth, grab vs. composite, filtered vs. unfiltered, low flow, etc.)?	Yes. Samples are representative of receptor exposure. Surface soil samples and subsurface soil samples were collected from discrete intervals.
Assess the effect of field QC results on data usability.	Field duplicate samples were collected at the rate of 1 per 10 soil samples. The average concentration of the soil sample and its duplicate sample were used in the risk assessments. Equipment rinsate blank samples were collected at the rate of 1 per 20 soil samples. Low-level detections at concentrations below the laboratory reporting limit were reported in one or more of the equipment blank samples for selected metals, dioxins, and common laboratory contaminant bis(2-ethylhexyl)phlalate. No significant impact on data usability resulted from these detections. Matrix spike (MS)/matrix spike duplicate (MSD) samples were at the rate of 1 per 20 soil samples. No significant impact on data usability was identified based on the matrix spike results.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	No significant sampling issues were noted. See Sections 6 and 7 of the RFI/CMS Report discuss the uncertainty analysis for the human health and ecological risk assessments for sampling and analysis.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Low-level SW-846 analytical methods were used for soil analysis in accordance with the MWP and WPA No. 013. Soil samples were analyzed for SVOCs by SW-846 Method 8270C, PAHs by SW-846 Method 8310, explosives by SW-846 Methods 8330 and 8332, pesticides by SW-846 Method 8081A, PCBs by SW-846 Method 8082, PCB congeners by EPA Method 1668, dioxin/furans by SW-846 Method 8290, and metals by SW-846 6010B, 6020, and 7471A.
Were detection limits adequate?	Low-level SW-846 Methods were used. The detection limits were adequate for screening against adjusted RBCs with the except as noted in Tables E.2-2.3 and E.2-2.3. As discussed in the uncertainties in Sections 6 and 7, the lack of sensitivity could lead to an underestimation of risk

TABLE G.1-1
DATA USABILITY WORKSHEET
SITE: SWMUs 40 and 71
MEDIUM: Soil

Activity	Comment
	at the site.
Summarize the effect of analytical technique issues on risk assessment, if applicable.	There were no analytical technical issues, which significantly affected the risk assessments. Sections 6 and 7 of the RFI/CMS Report discuss the uncertainty analysis for the human health and ecological risk assessments for sampling and analysis.
Data Quality Objectives	
Precision – How were duplicates handled?	Field duplicate samples were collected at the rate of 1 per 10 soil samples. The average concentration of the soil sample and its duplicate sample were used in the risk assessments.
Accuracy – How were split samples handled?	Split samples were not collected.
Representativeness – Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, COC problems, etc.).	No significant issues regarding data representativeness were noted.
Completeness – Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No significant issues regarding completeness of the data were noted. The overall completeness goal of 90$\pm$2% for field activities was exceeded for analytical analysis and field data collection.
Comparability – Indicate any problems associated with data comparability.	No significant issues regarding comparability of the data were noted.
Were the DQOs specified in the QAPP satisfied?	Yes, the DQOs specified in the QAPP were satisfied with the exception of the major anomalies identified for thallium and 1,3,5-trinitrobenzene which resulted in the R-flagging of approximately 40% of the QA/QC data in a data usability of 60% for these compounds.
Summarize the effect of DQO issues on the risk assessment, if applicable.	Not applicable
Data Validation and Interpretation	
What are the data validation requirements for this region?	EPA Region III modifications to the National Functional Guidelines for Data Validation.
What method or guidance was used to validate the data?	EPA Region III National Functional Guidelines for Data Validation.
Was the data validation method consistent with regional guidance? Discuss any discrepancies.	Yes, there were no discrepancies.
Were all data qualifiers defined? Discuss those which were not.	Yes, they were defined in the guidance document, data validation reports included in Appendix G of the RFI/CMS Report, and in the data tables included

TABLE G.1-1
DATA USABILITY WORKSHEET
SITE: SWMUs 40 and 71
MEDIUM: Soil

Activity	Comment
	in Section 4.0 of the RFI/CMS Report.
Which qualifiers represent usable data?	B, E, J, K, L, UJ, UL
Which qualifiers represent unusable data?	R
How are tentatively identified compounds handled?	Detected tentatively identified compounds are qualified NJ. These compounds are not used in the risk assessments.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	Section 6 of the RFI/CMS Report discusses uncertainties associated with qualified data.
Additional notes:	None.

Table G.1-1
Detected Chemicals in Soil Field Quality Control Samples
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID	EQB-1		MDL	RL	EQB-2		MDL	RL	EQB-3		MDL	RL	EQB-4		MDL	RL
Sample Date	11/12/2002				11/12/2002				11/13/2002				11/14/2002			
	Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (ug/L)																
Aluminum	<100	U	56.7	100	<100	U	56.7	100	<100	U	56.7	100	<100	U	56.7	100
Barium	1	B	0.3	10	0.33	B	0.3	10	0.39	B	0.3	10	0.36	B	0.3	10
Beryllium	<5	U	0.2	5	<5	U	0.2	5	0.31	B,B,o	0.2	5	<5	U	0.2	5
Chromium	1.3	B,B,o	0.8	5	1.5	B,B,o	0.8	5	1.6	B,B,o	0.8	5	0.84	B,B,o	0.8	5
Copper	<5	U,UL,w	1.5	5	<5	U,UL,w	1.5	5	<5	U,UL,w	1.5	5	<5	U,UL,w	1.5	5
Iron	<100	U	12.5	100	<100	U	12.5	100	12.6	B	12.5	100	<100	U	12.5	100
Magnesium	<1,000	U	12.3	1,000	<1,000	U	12.3	1,000	21	B,B,o	12.3	1,000	<1,000	U	12.3	1,000
Manganese	0.41	B,B,o	0.2	10	0.35	B,B,o	0.2	10	0.63	B,B,o	0.2	10	0.53	B,B,o	0.2	10
Mercury	<0.2	U	0.1	0.2	<0.2	U	0.1	0.2	<0.2	U	0.1	0.2	<0.2	U	0.1	0.2
Nickel	<5	U	1	5	<5	U	1	5	<5	U	1	5	<5	U	1	5
Potassium	<1,000	U,UL,w	40.1	1,000	<1,000	U,UL,w	40.1	1,000	<1,000	U,UL,w	40.1	1,000	<1,000	U,UL,w	40.1	1,000
Silver	3	B,B,o	0.8	5	2.5	B,B,o	0.8	5	2.5	B,B,o	0.8	5	2.7	B,B,o	0.8	5
Sodium	887	B	304	2,000	638	B	304	2,000	758	B	304	2,000	529	B	304	2,000
Vanadium	0.99	B	0.7	20	<20	U	0.7	20	<20	U	0.7	20	<20	U	0.7	20
Zinc	<20	U,UL,w	1.1	20	<20	U,UL,w	1.1	20	1.2	B,B,o	1.1	20	<20	U,UL,w	1.1	20
TCL VOCs (ug/L)																
1,1,2-Trichloro-1,2,2-Trifluoroethane	<5	U	5	5	<5	U	5	5	<5	U	5	5	<5	U	5	5
1,2,4-Trichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	0.8	J	0.2	5	<5	U	0.2	5
1,2-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,3-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,4-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
2-Butanone	12	J	2	13	12	J	2	13	<13	U	2	13	<13	U	2	13
Acetone	890	D	1	63	990	D	1	63	<13	U	1	13	<13	U	1	13
Chlorobenzene	<5	U	0.1	5	<5	U	0.1	5	<5	U	0.1	5	<5	U	0.1	5
Methylene Chloride	<5	U	0.2	5	2	J	0.2	5	3	J	0.2	5	3	J	0.2	5
Toluene	1	J	0.1	5	<5	U	0.1	5	<5	U	0.1	5	<5	U	0.1	5
TCL SVOCs (ug/L)																
Caprolactam	21		1	10	22		1	10	<10	U	1	10	<10	U	1	10
PAHs (ug/L)																
Pyrene	<0.5	U	0.12	0.5	<0.5	U	0.12	0.5	<0.5	U	0.12	0.5	4.9	PB,B,z	0.14	0.54

Table G.1-1
Detected Chemicals in Soil Field Quality Control Samples
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID	EQB-5		MDL	RL	EQB-6		MDL	RL	EQB-7		MDL	RL	EQB-8		MDL	RL
Sample Date	11/15/2002				11/18/2002				11/19/2002				11/20/2002			
	Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (ug/L)																
Aluminum	80.4	B,B,o	56.7	100	<100	U	56.7	100	<100	U	56.7	100	<100	U	56.7	100
Barium	3.1	B	0.3	10	<10	U	0.3	10	0.32	B	0.3	10	0.33	B	0.3	10
Beryllium	0.21	B,B,o	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
Chromium	1.8	B,B,o	0.8	5	1.9	B,B,o	0.8	5	1.9	B,B,o	0.8	5	2	B,B,o	0.8	5
Copper	<5	U,UL,w	1.5	5	<5	U,UL,w	1.5	5	1.7	B,L,w	1.5	5	<5	U,UL,w	1.5	5
Iron	<100	U	12.5	100	12.7	B	12.5	100	13.3	B	12.5	100	15.7	B	12.5	100
Magnesium	<1,000	U	12.3	1,000	<1,000	U	12.3	1,000	<1,000	U	12.3	1,000	<1,000	U	12.3	1,000
Manganese	0.46	B,B,o	0.2	10	0.58	B,B,o	0.2	10	0.7	B,B,o	0.2	10	0.61	B,B,o	0.2	10
Mercury	<0.2	U	0.1	0.2	<0.2	U	0.1	0.2	<0.2	U	0.1	0.2	<0.2	U	0.1	0.2
Nickel	<5	U	1	5	1.8	B,K,w	1	5	<5	U	1	5	<5	U	1	5
Potassium	<1,000	U,UL,w	40.1	1,000	49.8	B,L,w	40.1	1,000	48	B,L,w	40.1	1,000	40.7	B,L,w	40.1	1,000
Silver	2.5	B,B,o	0.8	5	3	B,B,o	0.8	5	2.7	B,B,o	0.8	5	2.7	B,B,o	0.8	5
Sodium	699	B	304	2,000	833	B	304	2,000	929	B	304	2,000	1,110	B	304	2,000
Vanadium	<20	U	0.7	20	<20	U	0.7	20	<20	U	0.7	20	<20	U	0.7	20
Zinc	<20	U,UL,w	1.1	20	<20	U,UL,w	1.1	20	<20	U,UL,w	1.1	20	<20	U,UL,w	1.1	20
TCL VOCs (ug/L)																
1,1,2-Trichloro-1,2,2-Trifluoroethane	2	JB,B,z	5	5	1	JB,B,z	5	5	2	JB,B,z	5	5	1	JB,B,z	5	5
1,2,4-Trichlorobenzene	0.9	JB,B,z	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,2-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,3-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,4-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
2-Butanone	<13	U	2	13	<13	U	2	13	<13	U	2	13	<13	U	2	13
Acetone	<13	U	1	13	<13	U	1	13	<13	U	1	13	<13	U	1	13
Chlorobenzene	<5	U	0.1	5	<5	U	0.1	5	<5	U	0.1	5	<5	U	0.1	5
Methylene Chloride	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
Toluene	3	J	0.1	5	4	J	0.1	5	4	J	0.1	5	3	J	0.1	5
TCL SVOCs (ug/L)																
Caprolactam	<10	U	1	10	<11	U	1	11	<10	U	1	10	<10	U	1	10
PAHs (ug/L)																
Pyrene	0.25	JBP,B,z	0.12	0.5	<0.53	U	0.13	0.53	<0.5	U	0.12	0.5	<0.26	U	0.066	0.26

Table G.1-1
Detected Chemicals in Soil Field Quality Control Samples
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date	TB1003 11/11/2002		MDL	RL	TB1004 11/11/2002		MDL	RL	TRIPBLANK1010 11/12/2002		MDL	RL	TRIPBLANK1016 11/13/2002		MDL	RL
	Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (ug/L)																
Aluminum	NT				NT				NT				NT			
Barium	NT				NT				NT				NT			
Beryllium	NT				NT				NT				NT			
Chromium	NT				NT				NT				NT			
Copper	NT				NT				NT				NT			
Iron	NT				NT				NT				NT			
Magnesium	NT				NT				NT				NT			
Manganese	NT				NT				NT				NT			
Mercury	NT				NT				NT				NT			
Nickel	NT				NT				NT				NT			
Potassium	NT				NT				NT				NT			
Silver	NT				NT				NT				NT			
Sodium	NT				NT				NT				NT			
Vanadium	NT				NT				NT				NT			
Zinc	NT				NT				NT				NT			
TCL VOCs (ug/L)																
1,1,2-Trichloro-1,2,2-Trifluoroethane	<5	U	5	5	<5	U	5	5	<5	U	5	5	<5	U	5	5
1,2,4-Trichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,2-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,3-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,4-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
2-Butanone	<13	U	2	13	<13	U	2	13	<13	U	2	13	<13	U	2	13
Acetone	<13	U	1	13	<13	U	1	13	<13	U	1	13	<13	U	1	13
Chlorobenzene	<5	U	0.1	5	<5	U	0.1	5	<5	U	0.1	5	<5	U	0.1	5
Methylene Chloride	<5	U	0.2	5	2	J	0.2	5	<5	U	0.2	5	3	J	0.2	5
Toluene	1	J	0.1	5	3	J	0.1	5	1	J	0.1	5	1	J	0.1	5
TCL SVOCs (ug/L)																
Caprolactam	NT				NT				NT				NT			
PAHs (ug/L)																
Pyrene	NT				NT				NT				NT			

Table G.1-1
Detected Chemicals in Soil Field Quality Control Samples
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date	TRIPBLANK 11/14/2002		MDL	RL	TRIPBLANK1020 11/15/2002		MDL	RL	TRIPBLANK1022 11/18/2002		MDL	RL	TRIPBLANK1096 11/19/2002		MDL	RL
	Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (ug/L)																
Aluminum	NT				NT				NT				NT			
Barium	NT				NT				NT				NT			
Beryllium	NT				NT				NT				NT			
Chromium	NT				NT				NT				NT			
Copper	NT				NT				NT				NT			
Iron	NT				NT				NT				NT			
Magnesium	NT				NT				NT				NT			
Manganese	NT				NT				NT				NT			
Mercury	NT				NT				NT				NT			
Nickel	NT				NT				NT				NT			
Potassium	NT				NT				NT				NT			
Silver	NT				NT				NT				NT			
Sodium	NT				NT				NT				NT			
Vanadium	NT				NT				NT				NT			
Zinc	NT				NT				NT				NT			
TCL VOCs (ug/L)																
1,1,2-Trichloro-1,2,2-Trifluoroethane	<5	U	5	5	2	JB,B,z	5	5	1	JB,B,z	5	5	1	JB,B,z	5	5
1,2,4-Trichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,2-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,3-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
1,4-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
2-Butanone	<13	U	2	13	<13	U	2	13	<13	U	2	13	<13	U	2	13
Acetone	<13	U	1	13	<13	U	1	13	<13	U	1	13	<13	U	1	13
Chlorobenzene	<5	U	0.1	5	<5	U	0.1	5	<5	U	0.1	5	<5	U	0.1	5
Methylene Chloride	3	J	0.2	5	<5	U	0.2	5	<5	U	0.2	5	<5	U	0.2	5
Toluene	2	J	0.1	5	4	J	0.1	5	3	J	0.1	5	3	J	0.1	5
TCL SVOCs (ug/L)																
Caprolactam	NT				NT				NT				NT			
PAHs (ug/L)																
Pyrene	NT				NT				NT				NT			

Table G.1-1
Detected Chemicals in Soil Field Quality Control Samples
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date	TRIPBLANK1094 11/20/2002		MDL	RL	TRIPBLANK1027 11/21/2002		MDL	RL	TRIPBLANK1030 11/22/2002		MDL	RL	EQBK71 4/21/2006		MDL	RL
	Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (ug/L)																
Aluminum	NT				NT				NT				<100	U	16	100
Barium	NT				NT				NT				<10	U	0.92	10
Beryllium	NT				NT				NT				<4	U	0.5	4
Chromium	NT				NT				NT				<50	U	5.5	50
Copper	NT				NT				NT				<3	U	0.32	3
Iron	NT				NT				NT				41	J	3.2	100
Magnesium	NT				NT				NT				<500	U	32	500
Manganese	NT				NT				NT				<10	U	0.74	10
Mercury	NT				NT				NT				0.071	J	0.037	0.4
Nickel	NT				NT				NT				<3	U	0.8	3
Potassium	NT				NT				NT				44	J	36	200
Silver	NT				NT				NT				<0.5	U	0.073	0.5
Sodium	NT				NT				NT				<500	U	59	500
Vanadium	NT				NT				NT				<10	U	0.26	10
Zinc	NT				NT				NT				11	JB,B,p	7.7	30
TCL VOCs (ug/L)																
1,1,2-Trichloro-1,2,2-Trifluoroethane	1	JB,B,z	5	5	2	JB,B,z	5	5	0.6	JB,B,z	5	5	NT			
1,2,4-Trichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	0.6	JB,B,z	0.2	5	NT			
1,2-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	0.2	JB,B,z	0.2	5	NT			
1,3-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	0.4	JB,B,z	0.2	5	NT			
1,4-Dichlorobenzene	<5	U	0.2	5	<5	U	0.2	5	0.4	JB,B,z	0.2	5	NT			
2-Butanone	<13	U	2	13	<13	U	2	13	<13	U,UJ,c	2	13	NT			
Acetone	<13	U	1	13	<13	U	1	13	<13	U	1	13	NT			
Chlorobenzene	<5	U	0.1	5	<5	U	0.1	5	0.2	JB,B,z	0.1	5	NT			
Methylene Chloride	<5	U	0.2	5	<5	U	0.2	5	2	JB,B,z	0.2	5	NT			
Toluene	3	J	0.1	5	3	J	0.1	5	0.9	JB,B,z	0.1	5	NT			
TCL SVOCs (ug/L)																
Caprolactam	NT				NT				NT				NT			
PAHs (ug/L)																
Pyrene	NT				NT				NT				NT			

Notes:
EQB = Equipment Blank
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
RL = Reporting Limit
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = reason code

Qualifiers:
B = Not detected substantially above the level reported in laboratory or field blanks.
D = Diluted sample.
J = Analyte present. Reported value may not be accurate or precise.
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
P = Greater than 40% difference for detected concentrations between the two GC or HPLC columns.
U = The compound was analyzed for but not detected.
UJ = Not detected, quantitation limit may be inaccurate or imprecise.
UL = Not detected, quantitation limit is probably higher.
c = Calibration failure; poor (RRF) or unstable (%D) response
o = Calibration blank contamination
p = Preparation blank contamination
w = Laboratory storage blank contamination
z = Method blank and/or storage blank contamination

TABLE G.1-2
DATA USABILITY WORKSHEET
SITE: SWMUs 40 and 71
MEDIUM: Groundwater

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data usability.	There were no problems identified during field sampling that affected data usability.
Are samples representative of receptor exposure for this medium (e.g., sample depth, grab vs. composite, filtered vs. unfiltered, low flow, etc.)?	Yes. Both filtered and unfiltered samples were collected for metals. Filtered metals samples were used in the risk assessment and are considered representative of dissolved concentrations in groundwater. Low-flow groundwater sampling techniques were used to collect the samples representative of groundwater quality.
Assess the effect of field QC results on data usability.	Field duplicate samples were collected at the rate of 1 per 10 groundwater samples. The average concentration of the groundwater sample and its duplicate sample were used in the risk assessments. Equipment rinsate blank samples were collected at the rate of 1 per 20 groundwater samples. Low-level detections at concentrations below the laboratory reporting limit were reported in one or more of the equipment blank samples for selected metals and in one equipment blank sample for dioxins. No significant impact on data usability resulted from these detections. Matrix spike (MS)/matrix spike duplicate (MSD) samples were at the rate of 1 per 20 groundwater samples. No significant impact on data usability was identified based on the matrix spike results.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	No significant sampling issues were noted. See Sections 6 of the RFI/CMS Report discuss the uncertainty analysis for the human health risk assessment for sampling and analysis.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Low-level SW-846 and EPA analytical methods were used for groundwater analysis in accordance with the MWP and WPA No. 013. Groundwater samples were analyzed for SVOCs by SW-846 Method 8270C, PAHs by SW-846 Method 8310, explosives by SW-846 Methods 8330 and 8332, pesticides by SW-846 Method 8081A, PCBs by SW-846 Method 8082, dioxin/furans by SW-846 Method 8290, and metals by SW-846 6010B, 6020, and 7470A, and perchlorate by Method EPA 314 (prior to 2007) and SW-846 Method 6850 (2007).

TABLE G.1-2
DATA USABILITY WORKSHEET
SITE: SWMUs 40 and 71
MEDIUM: Groundwater

Activity	Comment
Were detection limits adequate?	Yes. Low-level SW-846 Methods were used. The detection limits were adequate for screening against adjusted RBCs except as noted in Tables E.1-2.5 and E.2-2.5. As discussed in the uncertainties in Section 6, the lack of sensitivity could lead to an underestimation of risk at the site.
Summarize the effect of analytical technique issues on risk assessment, if applicable.	There were no analytical technical issues, which significantly affected the risk assessments. Section 6 of the RFI/CMS Report discusses the uncertainty analysis for the human health for sampling and analysis.
Data Quality Objectives	
Precision – How were duplicates handled?	Field duplicate samples were collected at the rate of 1 per 10 groundwater samples. The average concentration of the groundwater sample and its duplicate sample were used in the risk assessment.
Accuracy – How were split samples handled?	Split samples were not collected.
Representativeness – Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, COC problems, etc.).	No significant issues regarding data representativeness were noted.
Completeness – Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No significant issues regarding completeness of the data were noted. The overall completeness goal of 90$\pm$2% for field activities was exceeded for analytical analysis and field data collection.
Comparability – Indicate any problems associated with data comparability.	No significant issues regarding comparability of the data were noted.
Were the DQOs specified in the QAPP satisfied?	Yes, the DQOs specified in the QAPP were satisfied.
Summarize the effect of DQO issues on the risk assessment, if applicable.	Not applicable
Data Validation and Interpretation	
What are the data validation requirements for this region?	EPA Region III modifications to the National Functional Guidelines for Data Validation.
What method or guidance was used to validate the data?	EPA Region III National Functional Guidelines for Data Validation.
Was the data validation method consistent with regional guidance? Discuss any discrepancies.	Yes, there were no discrepancies.

TABLE G.1-2
DATA USABILITY WORKSHEET
SITE: SWMUs 40 and 71
MEDIUM: Groundwater

Activity	Comment
Were all data qualifiers defined? Discuss those which were not.	Yes, they were defined in the guidance document, data validation reports included in Appendix H of the RFI/CMS Report, and in the data tables included in Section 4 of the RFI/CMS Report.
Which qualifiers represent usable data?	B, J, JB, U
Which qualifiers represent unusable data?	R
How are tentatively identified compounds handled?	Detected tentatively identified compounds are qualified NJ. These compounds are not used in the risk assessment.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	Section 6 of the RFI/CMS Report discusses uncertainties associated with qualified data.
Additional notes:	None.

Table G.1-2
Detects Chemicals in Groundwater Field Quality Control Samples
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date	Units	EQBK-1 8/14/2007		MDL	RL	Trip Blank 1 8/13/2007		MDL	RL	Trip Blank 2 8/14/2007		MDL	RL	Trip Blank 3 8/14/2007		MDL	RL
		Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals																	
Calcium, Total	ug/L	330	J	40	500	NT				NT				NT			
Chromium, Total	ug/L	1.3	J	0.31	2	NT				NT				NT			
Iron, Total	ug/L	15	J,B,p	5.7	20	NT				NT				NT			
Lead, Total	ug/L	0.8	J	0.33	1	NT				NT				NT			
Manganese, Total	ug/L	0.69	J	0.43	3	NT				NT				NT			
Magnesium, Total	ug/L	87	J,B,p	38	500	NT				NT				NT			
Potassium, Total	ug/L	140	J	54	200	NT				NT				NT			
Zinc, Total	ug/L	27		0.84	10	NT				NT				NT			
TCL VOCs																	
Acetone	ug/L	<20	U	1.2	20	3.1	J,B,z	1.2	20	<20	U	1.2	20	<20	U	1.2	20
Toluene	ug/L	<1	U	0.072	1	<1	U	0.072	1	0.14	J	0.072	1	0.14	J	0.072	1
TCL SVOCs																	
Acetophenone	ug/L	0.048	J	0.043	5	NT				NT				NT			
Butyl Benzyl Phthalate	ug/L	0.14	J,B,z	0.029	5	NT				NT				NT			
Diethyl Phthalate	ug/L	0.048	J	0.034	5	NT				NT				NT			

Table G.1-2
Detects Chemicals in Groundwater Field Quality Control Samples
SWMUs 40 and 71 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date	Units	Trip Blank 4 8/14/2007 Result	LQ, VQ, r	MDL	RL	Trip Blank 5 8/15/2007 Result	LQ, VQ, r	MDL	RL	Trip Blank 6 8/15/2007 Result	LQ, VQ, r	MDL	RL
TAL Metals													
Calcium, Total	ug/L	NT				NT				NT			
Chromium, Total	ug/L	NT				NT				NT			
Iron, Total	ug/L	NT				NT				NT			
Lead, Total	ug/L	NT				NT				NT			
Manganese, Total	ug/L	NT				NT				NT			
Magnesium, Total	ug/L	NT				NT				NT			
Potassium, Total	ug/L	NT				NT				NT			
Zinc, Total	ug/L	NT				NT				NT			
TCL VOCs													
Acetone	ug/L	3.1	J,B,z	1.2	20	3	J,B,z	1.2	20	3.2	J,B,z	1.2	20
Toluene	ug/L	<1	U	0.072	1	<1	U	0.072	1	<1	U	0.072	1
TCL SVOCs													
Acetophenone	ug/L	NT				NT				NT			
Butyl Benzyl Phthalate	ug/L	NT				NT				NT			
Diethyl Phthalate	ug/L	NT				NT				NT			

Notes:
EQB = Equipment Blank
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
MDL = Method Detection Limit
RL = Reporting Limit
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = reason code

Qualifiers:
B = Not detected substantially above the level reported in laboratory or field blanks.
D = Diluted sample.
J = Analyte present. Reported value may not be accurate or precise.
U = The compound was analyzed for but not detected.
UJ = Not detected, quantitation limit may be inaccurate or imprecise.
UL = Not detected, quantitation limit is probably higher.
p = Preparation blank contamination
z = Method blank and/or storage blank contamination

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APPENDIX G.2.1

SOIL SAMPLING
2002-2003

APPENDIX G.2.2

ADDITIONAL INVESTIGATIONS SOIL SAMPLING
2006

APPENDIX G.2.3

ADDITIONAL INVESTIGATIONS GROUNDWATER SAMPLING
2007

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APPENDIX G.2.1

SOIL SAMPLING
2002-2003

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DATA VALIDATION REPORT - Level III Review

SDG No.: _____Q2788_____ **Fraction:**_VOCs, SVOCs, Pest., PCBs, PAH,___ __Explosives, Nitroglycerin, Metals___

Lab: _CompuChem_____ **Project Name:** __Radford SWMU 40/71_____

Reviewer: _____RA, AJ_____ **Date:** _____February 10, 2003_____

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the VOC analyses, severe loss of internal standards was observed in samples 40SS4 and D-1. All results were flagged "R,i" in these samples. These samples were re-analyzed with acceptable recoveries and results from the re-analyses should be used for these samples.

Minor Anomalies: For the VOC analyses, the method blank analyzed on 11/24/02 contained acetone at 1 ug/Kg, dichlorodifluoromethane at 0.5 ug/Kg, toluene at 0.7 ug/Kg, 1,4-dichlorobenzene at 0.3 ug/Kg, 1,2-dichlorobenzne at 0.3 ug/Kg, and 1,2,4-trichlorobenzene at 0.4 ug/Kg. The method blank analyzed on 11/25/02 contained trichlorofluoromethane at 3 ug/Kg, acetone at 15 ug/Kg, methylene chloride at 3 ug/Kg, and toluene at 1 ug/Kg. The method blank analyzed on 11/26/02 contained toluene at 1 ug/Kg. The method blank analyzed on 11/27/02 contained toluene at 1 ug/Kg. Positive results less than 10 times the blank concentration were flagged "B,z" for acetone and methylene chloride in the associated samples. Positive results less than 5 times the blank concentration were flagged "B,z" for the other compounds in the associated samples. The method blank also contained positive TIC results. Positive results reported in the associated field samples were manually crossed out on the result forms by the reviewer in the associated samples. The trip and equipment blanks were located in SDG R2788. These blanks contained positive results for toluene, acetone, 2-butanone and methylene chloride. Positive methylene chloride, acetone and 2-butanone results less than 10 times the blank concentration were flagged "B,x" in the associated samples. Positive toluene results less than 5 times the blank concentration were flagged "B,x" or "B,y" in the associated samples unless previously flagged due to other anomalies.

The CCV analyzed on 11/27/02 at 1017 displayed a %D greater than the control limit (i.e., 20%) with a negative bias for bromomethane at 21.4%. Non-detects were flagged "UJ,c" in the associated samples.

The recoveries for three surrogates were greater than the upper QC limit in samples 40SB9CRE and 40SB8F. The recoveries for surrogates toluene-d8 and 4-bromofluorobenzene were greater than the upper QC limit in samples D-1, 40SS4RE and 40SS5. Positive results were flagged "K,s" in these samples. The recoveries for surrogate toluene-d8 were greater than the QC limit in samples 40SS4, 40SS3, and 40SB11C. The recoveries for surrogate bromofluorobenzene were greater than the upper QC limit in samples s 40SS5RE and 40SS3RE. The recoveries for surrogate 1,2-dichloroethane were greater than the upper QC limit in sample 40SB9FRE and less than the lower QC limit in sample 40SB8FRE. Positive results were flagged "J,s" and non-detects were flagged "UJ,s" in these samples.

The MS/MSD recoveries for bromomethane (15%/17%), acetone (360%/380%), 2-butanone (350%/410%), 4-methyl-2-pentanone (320%/370%), 2-hexanone (320%/380%), 1,1,2,2-tetrachloroethane (180%/190%), 1,2-dibromo-3-chloropropane (180%/210%), methyl acetate (190%/200%), the MSD recovery for chloroethane (17%), and the %RPDs for all compounds except acetone, dichlorodifluoromethane, vinyl chloride, trichlorofluoromethane, chloroethane, tetrachloroethene, and xylene were outside the QC limit. Non-detects were flagged "UJ,m" and positive results were flagged "J,m" for the other compounds in the parent sample 40SB9C.

The recoveries for internal standards chlorobenzene-d5 and 1,4-dichlorobenzene were less than the lower QC limit in samples 40SS$, 40SS5, 40SS2, 40SS5RE, and 40SB8FRE. Positive associated results were flagged "J,i" and non-detects were flagged "UJ,i" unless previously flagged due to other anomalies. The original sample result should be used for sample 40SB8F and the re-analysis results should be used for sample 40SS2 since they displayed better internal standard recoveries. The recoveries for internal standard 1,4-dichlorobenzene were less than the lower QC limit in samples 71SS11, 40SS3, 40SS1, 40SB11F, 40SB11B, 40SB11C, 40SB9F, 40SB9C, D-1RE, 40SS4RE, 71SS11RE, 40SS3RE, 40SS2RE, 40SS1RE, 40SB11FRE, 40SB11BRE, 40SB11CRE, 40SB9CRE, and 40SB8F. Positive associated results were flagged "J,i" and non-detects were flagged "UJ,i" unless previously flagged due to other anomalies. The original sample results should be used for samples 71SS11, 40SS3, 40SS1, 40SB11F, 40SB11B, 40SB9F, 40SB9C, and 40SB8F and the re-analyses results should be used for samples D-1RE, 40SS4RE, 40SS5RE, 40SS2RE, and 40SB11CRE since they displayed better internal standard recoveries.

For the SVOC analyses, equipment blanks located in SDG R2788 contained caprolactam at 21 ug/L and 22 ug/L. Positive results were greater than 5 times the blank concentration and no data qualifying action was required. The method blanks contained positive TIC results. Positive results reported in the associated field samples were manually crossed out on the result forms by the reviewer in the associated samples.

The initial calibration analyzed on 11/7/02 displayed %RSDs greater than the control limit (i.e., 15%) for benzaldehyde at 17.8%, bis (2-chloroethyl)ether at 17.88%, 4-methylphenol at 21.06%, 2,4,5-trichlorophenol at 15.23%, 2,2-oxybis(1-chloropropane) at 28.3%, n-nitroso-di-n-propylamine at 17.5%, hexachloroethane at 17.7%, naphthalene at 15.3%, 4-chlroro-3-methylphenol at 15.3%, 2-methyl naphthalene at 16.1%, dimethylphthalate at 15.8%, acenapthylene at 22.3%, acenaphthene at 24.4%, dibenzofuran at 20.9%, fluorene at 18.6%, 4,6-dinitro-2-methylphenol at 17.3%, n-nitrosodiphenylamine at 24.9%, 4-bromophenyl-phenylether at 15.8%, atrazine at 57.9%, pentachlorophenol at 15.9%, phenanthrene at 16.2%, anthracene at 15.7%, carbazole at 15.5%, 3,3-dichlorobenzidine at 16.4%, chrysene at 16.5%, benzo(k)fluoranthene at 23.6%, and dibenzo(a,h)anthracene at 16.9%. Non-detects were flagged "UJ,r" for atrazine since the failure was serious enough (i.e., > 50%) to affect the non-detects. Positive results were flagged "J,r" for the other compounds in the associated samples.

The CCV analyzed on 11/14/02 at 1015 displayed a %D greater than the control limit (i.e., 20%) with a positive bias for hexachlorocyclopentadiene at 40.86% and with a negative bias for atrazine at 33.4%. No positive results were reported for hexachlorocyclopentadiene and no data qualifying action was required. Atrazine results were previously flagged due to initial calibration failure and no further data qualifying action was required.

The CCV analyzed on 11/18/02 at 2139 displayed %Ds greater than the control limit with a negative bias for atrazine at 44.55%, phenanthrene at 20.51%, and di-n-butylphthalate at 22.51%. Positive results were flagged "J,c" and non-detects were flagged "UJ,c" unless previously flagged due to other anomalies.

The CCV analyzed on 11/19/02 at 0949 displayed %Ds greater than the control limit with a negative bias for atrazine at 24.79%, and with a positive bias for 3,3-dichlorobenzidine at 25.2% and benzo(b)fluoranthene at 20.67%. All associated sample results were non-detects for 3,3-dichlorobenzidine and benzo(b)fluoranthene or were previously flagged and no further data qualifying action was required.

The CCV analyzed on 11/24/02 at 1004 displayed %Ds greater than the control limit with a negative bias for benzaldehyde at 20.12%, 2,2-oxybis(1-chloropropane) at 21.79%, caprolactam at 23.8%, 4-nitroaniline at 23.56%, atrazine at 53.53%, and with a positive bias for hexachlorobenzene at 23.25%. Non-detects were flagged "UJ,c" for failures with a negative bias unless previously flagged due to other anomalies. No positive results were reported for hexachlorobenzene and no data qualifying action was required.

The MS/MSD pair for sample 40SB9C displayed recoveries for 2-chlorophenol (130%/120%), 4-chloro-3-methylphenol (140%/140%), the MS recoveries for phenol (130%) and 2,4-dichlorophenol (130%), and the %RPD for benzaldehyde (58%) and 2,4-dinitrophenol (60%) were greater than the upper QC limits. No positive results were reported for these compounds in the parent sample, 40SB9C, and no data qualifying action was taken.

The LCS recoveries were greater than the upper QC limits for phenol (142%), 2-chlorophenol (146%), 2-nitrophenol (143%/135%), 2,4-dimethylphenol (148%/158%), 2,4-dichlorophenol (142%/144%), 4-chloro-3-methylphenol (140%/160%), 2,4,6-trichlorophenol (150%), 4-nitroaniline (116%), and pantachlorophenol (176%/172%). No positive results were reported for these compounds and no data qualifying action was required.

For the pesticides analyses, the CCV analyzed on 11/14/02 at 1546 displayed %Ds greater than the control limit (i.e., 15%) with a positive bias for 4,4-DDT at 21.88% and methoxychlor at 19.24%. No positive results were reported for these compounds in the associated samples and no data qualifying action was taken.

For the pesticides/PCB analyses, the CCV analyzed on 11/14/02 at 2252 displayed %Ds greater than the control limit with a negative bias for 4,4-DDE at 16.39%, 4,4-DDT at 18.49%, and aroclor-1260 at 16.5%. All associated sample results were non-detects and were flagged "UJ,c".

For the pesticides analyses, the CCV analyzed on 11/25/02 at 2131 displayed a %D greater than the control limit with a positive bias for 4,4-DDD at 16.98%. No positive results were reported in the associated samples and no data qualifying action was taken.

The recoveries for surrogate decachlorobiphenyl were greater than the upper control limit in samples S0SB12A (560%) and 40SS4 (161%). No action is required based on one surrogate failure and no data flags were applied. The recoveries for surrogates decachlorobiphenyl (38%) and tetrachloro-m-xylene (40%/40%) were less than the lower control limits in sample 40SS2. Positive results were flagged "L,s" and non-detects were flagged "UL,s." This sample was

re-analyzed with acceptable surrogate recoveries. Results from the re-analyses should be used for data interpretation purposes.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for several compounds in several samples. These results were flagged "J,g".

For the PAH analyses, the CCV analyzed on 11/15/02 at 1252 displayed %Ds greater than the control limit (i.e., 15%) with a positive bias for phenanthrene at 15.56% and fluoranthene at 18.26%. The CCV analyzed on 11/18/02 at 1117 displayed a %D greater than the control limit with a positive bias for acenaphthylene at 16.17%. The CCV analyzed on 11/19/02 at 0426 displayed %Ds greater than the control limit with a positive bias for pyrene at 16.48% benzo(b)fluoranthene at 15.34%, and acenaphthylene at 18.63%. The CCV analyzed on 11/21/02 at 0059 displayed %Ds greater than the control limit with a positive bias for fluorene at 16.88% and benzo(g,h,i)perylene at 15.39%. The CCV analyzed on 11/21/02 at 0735 displayed %Ds greater than the control limit with a positive bias for benzo(g,h,i)perylene at 18.08% and acenaphthylene at 15.39. Positive results were flagged "J,c" in the associated samples.

The surrogate recoveries for p-terphenyl were greater than the upper QC limit in samples 40SS1, 40SS4, 40SS2, 40SB11F, 40SB9F and 40SB8F. Positive results were flagged "K,s" in the these samples.

The MS/MSD recoveries for chrysene (-953%/-930%) and the %RPD for acenaphthene (60%) were outside the QC limit. This could be due to sample matrix interference. No data flags were applied to the chrysene result since the sample concentration was greater than 4 times the spiking amount. No data flags were applied to the acenaphthene result since the MS/MSD recoveries were acceptable.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for several compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

For the explosive analyses, the continuing calibration analyzed on 11/20/02 at 1155 displayed %Ds greater than the QC limit (i.e., 15%) with a positive bias for 1,3-dinitrobenzene at 17.06%, 2,4,6-trinitrotoluene at 16.04%, and 4-amino-2,6-dinitrotoluene at 17.29%. The continuing calibration analyzed on 11/21/02 at 0714 displayed %Ds greater than the QC limit with a positive bias for 1,3-dinitrobenzene at 16.04% and 4-amino-2,6-dinitrotoluene at 19.04%. No positive results were reported no data qualifying action was required. The continuing calibration analyzed on 11/21/02 at 1439 displayed %Ds greater than the QC limit with a negative bias for 2,4,6-trinitrotoluene at 19.32% and with a positive bias for 4-nitrotoluene at 18.71%. Non-detects were flagged "UJ,c" for 2,4,6-

trinitrotoluene in the associated samples. No positive results were reported for 4-nitrotoluene in the associated samples and no data qualifying action was taken.

The MS/MSD recoveries for nitrobenzene (43%/39%) were less than the lower QC limit (i.e., 50%). The %RPD for RDX (44%) was greater than the QC limit (i.e., 30%). The nitrobenzene non-detect was flagged "UJ,m" in the parent sample 40SB9C.

For the metal analyses, the initial CRDL percent recoveries for calcium (89%), copper (87.6%), lead (73%), potassium (68.8%), silver (113%), thallium (110.5%) and zinc (70.1%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "L,w" and non-detects were flagged "UL,w" for potassium and zinc in the associated samples. Positive silver and thallium results less than 2xCRDL were flagged "K,w" in the associated samples. Positive results for the other analytes were greater than 2xCRDL and no data qualifying action was required.

The method blanks contained negative results for calcium and zinc. All associated sample results were positive and were flagged "L,p" unless previously flagged due to other anomalies. The equipment blanks located in SDG R2788 contained barium and sodium at low concentrations. Positive sodium results less than 5 times the blank concentration were flagged "B,x" in the associated samples. Positive barium results were greater than 5 times the blank concentration and no data qualifying action was required. The initial and continuing calibration blanks also contained positive results for antimony, magnesium, manganese and negative results for calcium and zinc. All associated sample results were either greater than 5 times the blank concentration or were previously flagged. No further data qualifying action was required.

The MS/MSD recoveries for antimony (34.2%/36%), selenium (62.9%/72.9%), lead (210.8%/237.9%), thallium (48.2%/48.2%), manganese (51.5%/179.6%) and the MSD recoveries for arsenic (227%) and copper (125.4%) were outside the control limit (i.e., 75-125%). Positive results were flagged "L,m" and non-detects were flagged "UL,m" for antimony, selenium and thallium. Positive results were flagged "K,m" for lead, arsenic, manganese and copper unless previously flagged due to other anomalies.

The serial dilution %D for potassium (16.1%) was greater than the QC limit (i.e., 10%). Positive results were flagged "J,s" unless previously flagged due to other anomalies.

Correctable Anomalies: It should be noted that sample 71SS11 appeared twice on the COC received 11/12/02 by the lab. Containers for collection at 1445 were labeled 71SB11. The lab was instructed to use the ID on the containers which was 71SB11.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were raised.

It should be noted that the positive TIC results were flagged "NJ,t" in the associated samples. Except for data flagged "R", all data as qualified, are usable for their intended purpose based on the data reviewed.

Samples 40SB8A and 40SB8F were received in a cooler that was chilled to 1.1 degrees C, below the 2.0 degrees QC limit. No data qualifying action was taken since the samples were not frozen.

Signed: Rangan

SAMPLENUM	CLIENTID	QUOTENUMREF	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
Q2788-14	40SB11B	Q2788 1010	Q2788	SO	URS	RADFORD SWMU 40/71	11/13/02
Q2788-15	40SB11C	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/13/02
Q2788-13	40SB11F	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/13/02
Q2788-1	40SB12A	Q2788 1004	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-2	40SB12B	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-3	40SB12C	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-19	40SB8A	Q2788 1014	Q2788	SO	URS	RADFORD SWMU 40/71	11/14/02
Q2788-20	40SB8F	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/14/02
Q2788-16	40SB9A	Q2788 1013	Q2788	SO	URS	RADFORD SWMU 40/71	11/14/02
Q2788-18	40SB9C	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/14/02
Q2788-17	40SB9F	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/14/02
Q2788-12	40SS1	Q2788 1003	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-11	40SS2	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-10	40SS3	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-7	40SS4	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-8	40SS5	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-4	71SB11	Q2788 1004	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-9	71SS11	Q2788 1003	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-5	71SS12	Q2788 1004	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02
Q2788-6	D-1	Q2788 ↓	Q2788	SO	URS	RADFORD SWMU 40/71	11/12/02

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 4.39(g/mL) G Lab File ID: Q2788-14B71

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	1	JB B,Z
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	7	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	59	B B,Z
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	1	J
78-93-3	2-butanone	6	J B,Z
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	7	U
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	7	J
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	5	J
108-88-3	Toluene	4	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	18	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 4.39(g/mL) G Lab File ID: Q2788-14B71

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	0.6	J
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	1	J
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U UJ,i
541-73-1	1,3-Dichlorobenzene	7	U ↓
106-46-7	1,4-Dichlorobenzene	0.3	JB B,Z
95-50-1	1,2-Dichlorobenzene	7	U UJ,i
96-12-8	1,2-Dibromo-3-Chloropropane	7	U ↓
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	9	J
79-20-9	Methyl acetate	3	J
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 4.39 (g/mL) G Lab File ID: Q2788-14B71

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	60-29-7	ETHER	5.16	11.28	NJ NJ, t
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11BRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 4.47(g/mL) G Lab File ID: Q2788-14RA62

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U
74-87-3	Chloromethane	3	J
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	5	J
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	7	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	260	B
75-09-2	Methylene Chloride	7	JB B,Z
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	21	B,Z
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	7	U
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	12	
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	9	J
108-88-3	Toluene	4	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	18	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

Do not use RA 11/30/03

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11BRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 4.47(g/mL) G Lab File ID: Q2788-14RA62

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	0.9	J
100-42-5	Styrene	7	U
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	7	U
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	24	
79-20-9	Methyl acetate	26	
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	7	U

Do not use RA

UJ

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB11BRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 4.47 (g/mL) G Lab File ID: Q2788-14RA62

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	0.91	10.39	J NJ
2.	60-29-7	ETHER	1.16	25.20	NJ
3.					
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 1.44(g/mL) G Lab File ID: Q2788-15B71

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 27 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
75-71-8	Dichlorodifluoromethane	3	JB J,S
74-87-3	Chloromethane	24	U UJ,S
75-01-4	Vinyl Chloride	24	U
74-83-9	Bromomethane	24	U
75-00-3	Chloroethane	24	U
75-69-4	Trichlorofluoromethane	24	U
75-35-4	1,1-Dichloroethene	24	U
75-15-0	Carbon disulfide	24	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	24	U
67-64-1	Acetone	70	B B,X
75-09-2	Methylene Chloride	9	J J,S
156-60-5	trans-1,2-Dichloroethene	24	U UJ,S
1634-04-4	Methyl-tert-butyl ether	24	U
75-34-3	1,1-Dichloroethane	24	U
156-59-2	cis-1,2-Dichloroethene	24	U
78-93-3	2-butanone	10	J B,X
67-66-3	Chloroform	24	U UJ,S
71-55-6	1,1,1-Trichloroethane	24	U
56-23-5	Carbon Tetrachloride	24	U
71-43-2	Benzene	24	U
107-06-2	1,2-Dichloroethane	24	U
79-01-6	Trichloroethene	22	J
78-87-5	1,2-Dichloropropane	24	U
75-27-4	Bromodichloromethane	24	U
10061-01-5	cis-1,3-Dichloropropene	24	U
108-10-1	4-Methyl-2-pentanone	14	J J,S
108-88-3	Toluene	15	JB
10061-02-6	trans-1,3-Dichloropropene	24	U UJ,S
79-00-5	1,1,2-Trichloroethane	24	U
127-18-4	Tetrachloroethene	24	U
591-78-6	2-hexanone	59	U
124-48-1	Dibromochloromethane	24	U
106-93-4	1,2-Dibromoethane	24	U

Do not use RT 11/3/03 RS

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 1.44(g/mL) G Lab File ID: Q2788-15B71

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 27 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
108-90-7	Chlorobenzene	24	U UJ,S
100-41-4	Ethylbenzene	4	J J,S
100-42-5	Styrene	4	J ↓
75-25-2	Bromoform	24	U UJ,S
98-82-8	Isopropyl Benzene	24	U
79-34-5	1,1,2,2-Tetrachloroethane	24	U
541-73-1	1,3-Dichlorobenzene	24	U
106-46-7	1,4-Dichlorobenzene	24	U
95-50-1	1,2-Dichlorobenzene	24	U
96-12-8	1,2-Dibromo-3-Chloropropane	24	U
120-82-1	1,2,4-Trichlorobenzene	24	U
1330-20-7	Xylene (total)	26	J J,S
79-20-9	Methyl acetate	24	U UJ,S
110-82-7	Cyclohexane	24	U
108-87-2	Methylcyclohexane	24	U

Do not

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 1.44 (g/mL) G Lab File ID: Q2788-15B71

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 27 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~11.25~~	~~33.72~~	~~JB~~ 2 R
2.					1/3
3.					
4.					
5.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 3.35(g/mL) G Lab File ID: Q2788-15RA62

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 27 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-15-0	Carbon disulfide	10	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	10	U
67-64-1	Acetone	84	B
75-09-2	Methylene Chloride	10	JB
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl-tert-butyl ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-butanone	26	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	19	
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	7	J
108-88-3	Toluene	6	JB
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-hexanone	26	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 3.35(g/mL) G Lab File ID: Q2788-15RA62

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 27 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	0.9	J
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropyl Benzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
1330-20-7	Xylene (total)	26	J
79-20-9	Methyl acetate	10	U
110-82-7	Cyclohexane	10	U
108-87-2	Methylcyclohexane	10	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB11CRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 3.35 (g/mL) G Lab File ID: Q2788-15RA62

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 27 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	1.16	15.06	J NJ1
2.					
3.					
4.					
5.					
6.					
7.					
8.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 4.42(g/mL) G Lab File ID: Q2788-13B71

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 15 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		
75-71-8	Dichlorodifluoromethane	1	JB	B, Z
74-87-3	Chloromethane	7	U	
75-01-4	Vinyl Chloride	2	J	
74-83-9	Bromomethane	7	U	
75-00-3	Chloroethane	7	U	
75-69-4	Trichlorofluoromethane	7	U	
75-35-4	1,1-Dichloroethene	7	U	
75-15-0	Carbon disulfide	1	J	
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U	
67-64-1	Acetone	110	B	B, X
75-09-2	Methylene Chloride	7	U	
156-60-5	trans-1,2-Dichloroethene	7	U	
1634-04-4	Methyl-tert-butyl ether	7	U	
75-34-3	1,1-Dichloroethane	7	U	
156-59-2	cis-1,2-Dichloroethene	1	J	
78-93-3	2-butanone	16	J	B, X
67-66-3	Chloroform	7	U	
71-55-6	1,1,1-Trichloroethane	7	U	
56-23-5	Carbon Tetrachloride	7	U	
71-43-2	Benzene	2	J	
107-06-2	1,2-Dichloroethane	7	U	
79-01-6	Trichloroethene	5	J	
78-87-5	1,2-Dichloropropane	7	U	
75-27-4	Bromodichloromethane	7	U	
10061-01-5	cis-1,3-Dichloropropene	7	U	
108-10-1	4-Methyl-2-pentanone	4	J	
108-88-3	Toluene	4	JB	B, X
10061-02-6	trans-1,3-Dichloropropene	7	U	
79-00-5	1,1,2-Trichloroethane	7	U	
127-18-4	Tetrachloroethene	7	U	
591-78-6	2-hexanone	17	U	
124-48-1	Dibromochloromethane	7	U	
106-93-4	1,2-Dibromoethane	7	U	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 4.42(g/mL) G Lab File ID: Q2788-13B71

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 15 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	1	J
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U UJ
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	7	U
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	7	J
79-20-9	Methyl acetate	4	J
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	0.8	J

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 4.42 (g/mL) G Lab File ID: Q2788-13B71

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 15 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 3.83(g/mL) G Lab File ID: Q2788-13RA62

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 15 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	U
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	3	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	8	U
67-64-1	Acetone	120	B
75-09-2	Methylene Chloride	6	JB
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	17	JB
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	1	J
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	14	
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	9	J
108-88-3	Toluene	7	JB
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	19	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 3.83(g/mL) G Lab File ID: Q2788-13RA62

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 15 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	3	J
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	28	
79-20-9	Methyl acetate	14	
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

Do not use for RA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB11FRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 3.83 (g/mL) G Lab File ID: Q2788-13RA62

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. 15 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-1

Sample wt/vol: 4.99(g/mL) G Lab File ID: Q2788-1RB71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 15 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	1	J
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	3	J
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	U
75-15-0	Carbon disulfide	6	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	6	U
67-64-1	Acetone	200	B
75-09-2	Methylene Chloride	6	U
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl-tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-butanone	28	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
71-43-2	Benzene	0.8	J
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	4	J
78-87-5	1,2-Dichloropropane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	3	J
108-88-3	Toluene	3	JB B, =
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	1	J
591-78-6	2-hexanone	2	J
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-1

Sample wt/vol: 4.99(g/mL) G Lab File ID: Q2788-1RB71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 15 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	0.7	J
100-42-5	Styrene	0.8	J
75-25-2	Bromoform	6	U
98-82-8	Isopropyl Benzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	0.3	J
106-46-7	1,4-Dichlorobenzene	0.6	JB B,Z
95-50-1	1,2-Dichlorobenzene	0.4	JB ↓
96-12-8	1,2-Dibromo-3-Chloropropane	0.4	J
120-82-1	1,2,4-Trichlorobenzene	0.7	JB B,Z
1330-20-7	Xylene (total)	5	J
79-20-9	Methyl acetate	6	U
110-82-7	Cyclohexane	6	U
108-87-2	Methylcyclohexane	6	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-1

Sample wt/vol: 4.99 (g/mL) G Lab File ID: Q2788-1RB71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 15 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	3.82	7.16	J NJ
2.		UNKNOWN	10.13	7.13	J
3.					
4.					
5.					
6.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-2

Sample wt/vol: 3.91(g/mL) G Lab File ID: Q2788-2B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 26 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	9	U
74-87-3	Chloromethane	2	J
75-01-4	Vinyl Chloride	9	U
74-83-9	Bromomethane	2	J
75-00-3	Chloroethane	9	U
75-69-4	Trichlorofluoromethane	9	U
75-35-4	1,1-Dichloroethene	9	U
75-15-0	Carbon disulfide	9	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	9	U
67-64-1	Acetone	34	B
75-09-2	Methylene Chloride	1	J
156-60-5	trans-1,2-Dichloroethene	9	U
1634-04-4	Methyl-tert-butyl ether	9	U
75-34-3	1,1-Dichloroethane	9	U
156-59-2	cis-1,2-Dichloroethene	9	U
78-93-3	2-butanone	7	J
67-66-3	Chloroform	9	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
71-43-2	Benzene	9	U
107-06-2	1,2-Dichloroethane	9	U
79-01-6	Trichloroethene	7	J
78-87-5	1,2-Dichloropropane	9	U
75-27-4	Bromodichloromethane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
108-10-1	4-Methyl-2-pentanone	6	J
108-88-3	Toluene	4	JB B1y
10061-02-6	trans-1,3-Dichloropropene	9	U
79-00-5	1,1,2-Trichloroethane	9	U
127-18-4	Tetrachloroethene	9	U
591-78-6	2-hexanone	22	U
124-48-1	Dibromochloromethane	9	U
106-93-4	1,2-Dibromoethane	9	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-2

Sample wt/vol: 3.91(g/mL) G Lab File ID: Q2788-2B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 26 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	9	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	1	J
75-25-2	Bromoform	9	U
98-82-8	Isopropyl Benzene	9	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U
541-73-1	1,3-Dichlorobenzene	9	U
106-46-7	1,4-Dichlorobenzene	0.4	JB B,Z
95-50-1	1,2-Dichlorobenzene	9	U
96-12-8	1,2-Dibromo-3-Chloropropane	9	U
120-82-1	1,2,4-Trichlorobenzene	9	U
1330-20-7	Xylene (total)	10	J
79-20-9	Methyl acetate	9	U
110-82-7	Cyclohexane	9	U
108-87-2	Methylcyclohexane	9	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-2

Sample wt/vol: 3.91 (g/mL) G Lab File ID: Q2788-2B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 26 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-3

Sample wt/vol: 2.75(g/mL) G Lab File ID: Q2788-3B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 39 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	2	JB B/Z
74-87-3	Chloromethane	3	J
75-01-4	Vinyl Chloride	15	U
74-83-9	Bromomethane	7	J
75-00-3	Chloroethane	15	U
75-69-4	Trichlorofluoromethane	15	U
75-35-4	1,1-Dichloroethene	15	U
75-15-0	Carbon disulfide	15	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	15	U
67-64-1	Acetone	390	B
75-09-2	Methylene Chloride	3	J
156-60-5	trans-1,2-Dichloroethene	15	U
1634-04-4	Methyl-tert-butyl ether	15	U
75-34-3	1,1-Dichloroethane	15	U
156-59-2	cis-1,2-Dichloroethene	15	U
78-93-3	2-butanone	74	
67-66-3	Chloroform	15	U
71-55-6	1,1,1-Trichloroethane	15	U
56-23-5	Carbon Tetrachloride	15	U
71-43-2	Benzene	2	J
107-06-2	1,2-Dichloroethane	15	U
79-01-6	Trichloroethene	11	J
78-87-5	1,2-Dichloropropane	15	U
75-27-4	Bromodichloromethane	15	U
10061-01-5	cis-1,3-Dichloropropene	15	U
108-10-1	4-Methyl-2-pentanone	6	J
108-88-3	Toluene	5	JB B/J
10061-02-6	trans-1,3-Dichloropropene	15	U
79-00-5	1,1,2-Trichloroethane	15	U
127-18-4	Tetrachloroethene	15	U
591-78-6	2-hexanone	2	J
124-48-1	Dibromochloromethane	15	U
106-93-4	1,2-Dibromoethane	15	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-3

Sample wt/vol: 2.75(g/mL) G Lab File ID: Q2788-3B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 39 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	15	U
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	1	J
75-25-2	Bromoform	15	U
98-82-8	Isopropyl Benzene	15	U
79-34-5	1,1,2,2-Tetrachloroethane	15	U
541-73-1	1,3-Dichlorobenzene	15	U
106-46-7	1,4-Dichlorobenzene	15	U
95-50-1	1,2-Dichlorobenzene	15	U
96-12-8	1,2-Dibromo-3-Chloropropane	15	U
120-82-1	1,2,4-Trichlorobenzene	15	U
1330-20-7	Xylene (total)	8	J
79-20-9	Methyl acetate	15	U
110-82-7	Cyclohexane	15	U
108-87-2	Methylcyclohexane	15	U

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-3

Sample wt/vol: 2.75 (g/mL) G Lab File ID: Q2788-3B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 39 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-19

Sample wt/vol: 2.00(g/mL) G Lab File ID: Q2788-19RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 19 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	15	U
74-87-3	Chloromethane	15	U
75-01-4	Vinyl Chloride	15	U
74-83-9	Bromomethane	15	U UJ, C
75-00-3	Chloroethane	15	U
75-69-4	Trichlorofluoromethane	15	U
75-35-4	1,1-Dichloroethene	15	U
75-15-0	Carbon disulfide	15	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	15	U
67-64-1	Acetone	69	
75-09-2	Methylene Chloride	4	J B, X
156-60-5	trans-1,2-Dichloroethene	15	U
1634-04-4	Methyl-tert-butyl ether	15	U
75-34-3	1,1-Dichloroethane	15	U
156-59-2	cis-1,2-Dichloroethene	15	U
78-93-3	2-butanone	39	U
67-66-3	Chloroform	15	U
71-55-6	1,1,1-Trichloroethane	15	U
56-23-5	Carbon Tetrachloride	15	U
71-43-2	Benzene	15	U
107-06-2	1,2-Dichloroethane	15	U
79-01-6	Trichloroethene	6	J
78-87-5	1,2-Dichloropropane	15	U
75-27-4	Bromodichloromethane	15	U
10061-01-5	cis-1,3-Dichloropropene	15	U
108-10-1	4-Methyl-2-pentanone	23	J
108-88-3	Toluene	15	JB
10061-02-6	trans-1,3-Dichloropropene	15	U
79-00-5	1,1,2-Trichloroethane	15	U
127-18-4	Tetrachloroethene	15	U
591-78-6	2-hexanone	39	U
124-48-1	Dibromochloromethane	15	U
106-93-4	1,2-Dibromoethane	15	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-19

Sample wt/vol: 2.00(g/mL) G Lab File ID: Q2788-19RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 19 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	15	U
100-41-4	Ethylbenzene	3	J
100-42-5	Styrene	15	U
75-25-2	Bromoform	15	U
98-82-8	Isopropyl Benzene	15	U
79-34-5	1,1,2,2-Tetrachloroethane	15	U
541-73-1	1,3-Dichlorobenzene	15	U
106-46-7	1,4-Dichlorobenzene	15	U
95-50-1	1,2-Dichlorobenzene	15	U
96-12-8	1,2-Dibromo-3-Chloropropane	15	U
120-82-1	1,2,4-Trichlorobenzene	15	U
1330-20-7	Xylene (total)	29	J
79-20-9	Methyl acetate	15	U
110-82-7	Cyclohexane	15	U
108-87-2	Methylcyclohexane	15	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-19

Sample wt/vol: 2.00 (g/mL) G Lab File ID: Q2788-19RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 19 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 3.51(g/mL) G Lab File ID: Q2788-2062

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 21 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	9	U
74-87-3	Chloromethane	9	U
75-01-4	Vinyl Chloride	9	U
74-83-9	Bromomethane	3	J K,S
75-00-3	Chloroethane	9	U
75-69-4	Trichlorofluoromethane	9	U
75-35-4	1,1-Dichloroethene	9	U
75-15-0	Carbon disulfide	25	K,S
76-13-1	1,1,2-trichloro-1,2,2-triflu	9	U
67-64-1	Acetone	240	K,S
75-09-2	Methylene Chloride	2	J B,K
156-60-5	trans-1,2-Dichloroethene	9	U
1634-04-4	Methyl-tert-butyl ether	9	U
75-34-3	1,1-Dichloroethane	9	U
156-59-2	cis-1,2-Dichloroethene	9	U
78-93-3	2-butanone	39	K,S
67-66-3	Chloroform	9	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
71-43-2	Benzene	3	J K,S
107-06-2	1,2-Dichloroethane	9	U
79-01-6	Trichloroethene	7	J K,S
78-87-5	1,2-Dichloropropane	9	U
75-27-4	Bromodichloromethane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
108-10-1	4-Methyl-2-pentanone	23	U
108-88-3	Toluene	9	B K,S
10061-02-6	trans-1,3-Dichloropropene	9	U
79-00-5	1,1,2-Trichloroethane	9	U
127-18-4	Tetrachloroethene	9	U
591-78-6	2-hexanone	23	U
124-48-1	Dibromochloromethane	9	U
106-93-4	1,2-Dibromoethane	9	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 3.51(g/mL) G Lab File ID: Q2788-2062

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 21 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	47	K,S
100-41-4	Ethylbenzene	6	J↓
100-42-5	Styrene	9	U
75-25-2	Bromoform	9	U
98-82-8	Isopropyl Benzene	5	J K,S
79-34-5	1,1,2,2-Tetrachloroethane	9	U UJ,I
541-73-1	1,3-Dichlorobenzene	9	U↓
106-46-7	1,4-Dichlorobenzene	10	K,S
95-50-1	1,2-Dichlorobenzene	9	U UJ,I
96-12-8	1,2-Dibromo-3-Chloropropane	9	U↓
120-82-1	1,2,4-Trichlorobenzene	9	U
1330-20-7	Xylene (total)	25	J K,S
79-20-9	Methyl acetate	120	↓
110-82-7	Cyclohexane	9	U
108-87-2	Methylcyclohexane	9	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 3.51 (g/mL) G Lab File ID: Q2788-2062

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 21 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	7446-09-5	SULFUR DIOXIDE	0.84	1201	NJ NJ, X
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
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30.					

FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 3.51(g/mL) G Lab File ID: Q2788-20RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 21 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG		Q
75-71-8	Dichlorodifluoromethane	9	U	UJ,5
74-87-3	Chloromethane	9	U	
75-01-4	Vinyl Chloride	9	U	
74-83-9	Bromomethane	9	U	UJ
75-00-3	Chloroethane	9	U	UJ,5
75-69-4	Trichlorofluoromethane	9	U	
75-35-4	1,1-Dichloroethene	9	U	
75-15-0	Carbon disulfide	9	U	
76-13-1	1,1,2-trichloro-1,2,2-triflu	9	U	
67-64-1	Acetone	23	U	
75-09-2	Methylene Chloride	9	U	
156-60-5	trans-1,2-Dichloroethene	9	U	
1634-04-4	Methyl-tert-butyl ether	9	U	
75-34-3	1,1-Dichloroethane	9	U	
156-59-2	cis-1,2-Dichloroethene	9	U	
78-93-3	2-butanone	23	U	
67-66-3	Chloroform	9	U	
71-55-6	1,1,1-Trichloroethane	9	U	
56-23-5	Carbon Tetrachloride	9	U	
71-43-2	Benzene	9	U	
107-06-2	1,2-Dichloroethane	9	U	
79-01-6	Trichloroethene	6	J	J,5
78-87-5	1,2-Dichloropropane	9	U	UJ,5
75-27-4	Bromodichloromethane	9	U	
10061-01-5	cis-1,3-Dichloropropene	9	U	
108-10-1	4-Methyl-2-pentanone	13	J	J,5
108-88-3	Toluene	12	B	
10061-02-6	trans-1,3-Dichloropropene	9	U	UJ,5
79-00-5	1,1,2-Trichloroethane	9	U	
127-18-4	Tetrachloroethene	9	U	
591-78-6	2-hexanone	23	U	
124-48-1	Dibromochloromethane	9	U	
106-93-4	1,2-Dibromoethane	9	U	

Do not use RA V3/10-3

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 3.51(g/mL) G Lab File ID: Q2788-20RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 21 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	9	U UJ/S
100-41-4	Ethylbenzene	2	J J/S
100-42-5	Styrene	9	U UJ/S
75-25-2	Bromoform	9	U
98-82-8	Isopropyl Benzene	9	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U
541-73-1	1,3-Dichlorobenzene	9	U
106-46-7	1,4-Dichlorobenzene	9	U
95-50-1	1,2-Dichlorobenzene	9	U
96-12-8	1,2-Dibromo-3-Chloropropane	9	U
120-82-1	1,2,4-Trichlorobenzene	9	U
1330-20-7	Xylene (total)	20	J J/S
79-20-9	Methyl acetate	9	U UJ/S
110-82-7	Cyclohexane	9	U
108-87-2	Methylcyclohexane	9	U

Do not use RA 1/31/03

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB8FRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 3.51 (g/mL) G Lab File ID: Q2788-20RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 21 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-16

Sample wt/vol: 2.02(g/mL) G Lab File ID: Q2788-16B71

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	1	JB B,Z
74-87-3	Chloromethane	15	U
75-01-4	Vinyl Chloride	15	U
74-83-9	Bromomethane	15	U
75-00-3	Chloroethane	15	U
75-69-4	Trichlorofluoromethane	15	U
75-35-4	1,1-Dichloroethene	15	U
75-15-0	Carbon disulfide	15	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	15	U
67-64-1	Acetone	54	B
75-09-2	Methylene Chloride	5	JB B,Z
156-60-5	trans-1,2-Dichloroethene	15	U
1634-04-4	Methyl-tert-butyl ether	15	U
75-34-3	1,1-Dichloroethane	15	U
156-59-2	cis-1,2-Dichloroethene	15	U
78-93-3	2-butanone	6	J
67-66-3	Chloroform	15	U
71-55-6	1,1,1-Trichloroethane	15	U
56-23-5	Carbon Tetrachloride	15	U
71-43-2	Benzene	15	U
107-06-2	1,2-Dichloroethane	15	U
79-01-6	Trichloroethene	13	J
78-87-5	1,2-Dichloropropane	15	U
75-27-4	Bromodichloromethane	15	U
10061-01-5	cis-1,3-Dichloropropene	15	U
108-10-1	4-Methyl-2-pentanone	12	J
108-88-3	Toluene	4	JB B,Y
10061-02-6	trans-1,3-Dichloropropene	15	U
79-00-5	1,1,2-Trichloroethane	15	U
127-18-4	Tetrachloroethene	15	U
591-78-6	2-hexanone	38	U
124-48-1	Dibromochloromethane	15	U
106-93-4	1,2-Dibromoethane	15	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-16

Sample wt/vol: 2.02(g/mL) G Lab File ID: Q2788-16B71

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	15	U
100-41-4	Ethylbenzene	15	U
100-42-5	Styrene	0.8	J
75-25-2	Bromoform	15	U
98-82-8	Isopropyl Benzene	15	U
79-34-5	1,1,2,2-Tetrachloroethane	15	U
541-73-1	1,3-Dichlorobenzene	15	U
106-46-7	1,4-Dichlorobenzene	15	U
95-50-1	1,2-Dichlorobenzene	15	U
96-12-8	1,2-Dibromo-3-Chloropropane	15	U
120-82-1	1,2,4-Trichlorobenzene	15	U
1330-20-7	Xylene (total)	3	J
79-20-9	Methyl acetate	15	U
110-82-7	Cyclohexane	15	U
108-87-2	Methylcyclohexane	15	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-16

Sample wt/vol: 2.02 (g/mL) G Lab File ID: Q2788-16B71

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~11.24~~	~~23.18~~ RA 11	~~JB~~ 3.03
2.					
3.					
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 1.84 (g/mL) G Lab File ID: Q2788-18B71

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 23 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	2	JB B,Z
74-87-3	Chloromethane	18	U
75-01-4	Vinyl Chloride	18	U
74-83-9	Bromomethane	18	U UJ,M
75-00-3	Chloroethane	18	U UJ,M
75-69-4	Trichlorofluoromethane	18	U
75-35-4	1,1-Dichloroethene	18	U
75-15-0	Carbon disulfide	31	J,M
76-13-1	1,1,2-trichloro-1,2,2-triflu	18	U J,M
67-64-1	Acetone	94	B J,M
75-09-2	Methylene Chloride	4	J B,Z
156-60-5	trans-1,2-Dichloroethene	18	U
1634-04-4	Methyl-tert-butyl ether	18	U
75-34-3	1,1-Dichloroethane	18	U
156-59-2	cis-1,2-Dichloroethene	18	U
78-93-3	2-butanone	44	U
67-66-3	Chloroform	18	U
71-55-6	1,1,1-Trichloroethane	18	U
56-23-5	Carbon Tetrachloride	18	U
71-43-2	Benzene	18	U
107-06-2	1,2-Dichloroethane	18	U
79-01-6	Trichloroethene	18	J,M
78-87-5	1,2-Dichloropropane	18	U
75-27-4	Bromodichloromethane	18	U
10061-01-5	cis-1,3-Dichloropropene	18	U
108-10-1	4-Methyl-2-pentanone	14	J J,M
108-88-3	Toluene	11	JB
10061-02-6	trans-1,3-Dichloropropene	18	U
79-00-5	1,1,2-Trichloroethane	18	U
127-18-4	Tetrachloroethene	18	U
591-78-6	2-hexanone	44	U
124-48-1	Dibromochloromethane	18	U
106-93-4	1,2-Dibromoethane	18	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 1.84(g/mL) G Lab File ID: Q2788-18B71

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 23 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	18	U
100-41-4	Ethylbenzene	3	J J/m
100-42-5	Styrene	2	J
75-25-2	Bromoform	18	U
98-82-8	Isopropyl Benzene	18	U
79-34-5	1,1,2,2-Tetrachloroethane	18	U
541-73-1	1,3-Dichlorobenzene	18	U
106-46-7	1,4-Dichlorobenzene	18	U
95-50-1	1,2-Dichlorobenzene	18	U
96-12-8	1,2-Dibromo-3-Chloropropane	18	U
120-82-1	1,2,4-Trichlorobenzene	18	U
1330-20-7	Xylene (total)	20	J
79-20-9	Methyl acetate	18	U
110-82-7	Cyclohexane	18	U
108-87-2	Methylcyclohexane	18	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 1.84 (g/mL) G Lab File ID: Q2788-18B71

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 23 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	7446-09-5	SULFUR DIOXIDE	6.75	142.4	NJ NJ t
2.					
3.					
4.					
5.					
6.					
7.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 2.12(g/mL) G Lab File ID: Q2788-18RA62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 23 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	15	U
74-87-3	Chloromethane	15	U
75-01-4	Vinyl Chloride	15	U
74-83-9	Bromomethane	15	U
75-00-3	Chloroethane	15	U
75-69-4	Trichlorofluoromethane	15	U
75-35-4	1,1-Dichloroethene	15	U
75-15-0	Carbon disulfide	11	J K15
76-13-1	1,1,2-trichloro-1,2,2-triflu	15	U
67-64-1	Acetone	53	K15
75-09-2	Methylene Chloride	3	J B1X
156-60-5	trans-1,2-Dichloroethene	15	U
1634-04-4	Methyl-tert-butyl ether	15	U
75-34-3	1,1-Dichloroethane	15	U
156-59-2	cis-1,2-Dichloroethene	15	U
78-93-3	2-butanone	38	U
67-66-3	Chloroform	15	U
71-55-6	1,1,1-Trichloroethane	15	U
56-23-5	Carbon Tetrachloride	15	U
71-43-2	Benzene	15	U
107-06-2	1,2-Dichloroethane	15	U
79-01-6	Trichloroethene	12	J K15
78-87-5	1,2-Dichloropropane	15	U
75-27-4	Bromodichloromethane	15	U
10061-01-5	cis-1,3-Dichloropropene	15	U
108-10-1	4-Methyl-2-pentanone	38	U
108-88-3	Toluene	5	JB B1Z
10061-02-6	trans-1,3-Dichloropropene	15	U
79-00-5	1,1,2-Trichloroethane	15	U
127-18-4	Tetrachloroethene	15	U
591-78-6	2-hexanone	38	U
124-48-1	Dibromochloromethane	15	U
106-93-4	1,2-Dibromoethane	15	U

Do not use RT 11/3/03

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 2.12(g/mL) G Lab File ID: Q2788-18RA62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 23 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
108-90-7	Chlorobenzene		15	U
100-41-4	Ethylbenzene		15	U
100-42-5	Styrene		15	U
75-25-2	Bromoform		15	U
98-82-8	Isopropyl Benzene		15	U
79-34-5	1,1,2,2-Tetrachloroethane		15	U
541-73-1	1,3-Dichlorobenzene		15	U
106-46-7	1,4-Dichlorobenzene		15	U
95-50-1	1,2-Dichlorobenzene		15	U
96-12-8	1,2-Dibromo-3-Chloropropane		15	U
120-82-1	1,2,4-Trichlorobenzene		15	U
1330-20-7	Xylene (total)		46	U
79-20-9	Methyl acetate		16	
110-82-7	Cyclohexane		15	U
108-87-2	Methylcyclohexane		15	U

Do not RA 45 11/3/03 U U U K15

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB9CRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 2.12 (g/mL) G Lab File ID: Q2788-18RA62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 23 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	7446-09-5	SULFUR DIOXIDE	0.85	593.3	NJ
2.	7446-09-5	SULFUR DIOXIDE	0.97	2518	NJ
3.		~~LABORATORY ARTIFACT~~	~~4.40~~	~~15.74~~	~~JB~~
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 2.80(g/mL) G Lab File ID: Q2788-17B71

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	11	U
74-87-3	Chloromethane	11	U
75-01-4	Vinyl Chloride	11	U
74-83-9	Bromomethane	6	J
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-15-0	Carbon disulfide	63	
76-13-1	1,1,2-trichloro-1,2,2-triflu	11	U
67-64-1	Acetone	250	B
75-09-2	Methylene Chloride	2	J B,X
156-60-5	trans-1,2-Dichloroethene	11	U
1634-04-4	Methyl-tert-butyl ether	11	U
75-34-3	1,1-Dichloroethane	11	U
156-59-2	cis-1,2-Dichloroethene	11	U
78-93-3	2-butanone	41	
67-66-3	Chloroform	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
71-43-2	Benzene	1	J
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	9	J
78-87-5	1,2-Dichloropropane	11	U
75-27-4	Bromodichloromethane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-10-1	4-Methyl-2-pentanone	10	J
108-88-3	Toluene	12	B
10061-02-6	trans-1,3-Dichloropropene	11	U
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
591-78-6	2-hexanone	28	U
124-48-1	Dibromochloromethane	11	U
106-93-4	1,2-Dibromoethane	11	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 2.80(g/mL) G Lab File ID: Q2788-17B71

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	6	J
100-42-5	Styrene	11	U
75-25-2	Bromoform	11	U
98-82-8	Isopropyl Benzene	0.9	J
79-34-5	1,1,2,2-Tetrachloroethane	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	3	JB
95-50-1	1,2-Dichlorobenzene	11	U
96-12-8	1,2-Dibromo-3-Chloropropane	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
1330-20-7	Xylene (total)	14	J
79-20-9	Methyl acetate	40	
110-82-7	Cyclohexane	11	U
108-87-2	Methylcyclohexane	11	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 2.80 (g/mL) G Lab File ID: Q2788-17B71

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

Number TICs found: 8 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	3.15	95.01	J NJ
2.		UNKNOWN	3.48	322.8	J
3.	7446-09-5	SULFUR DIOXIDE	6.86	151.5	NJ
4.	500-00-5	CYCLOHEXENE, 4-METHYL-1-(1-M	11.57	64.20	NJ
5.		CYCLIC ALKANE	11.89	18.15	J
6.	527-84-4	BENZENE, 1-METHYL-2-(1-METHY	11.98	13.61	NJ
7.	4695-62-9	BICYCLO[2.2.1]HEPTAN-2-ONE,	12.82	12.37	NJ
8.	464-48-2	BICYCLO[2.2.1]HEPTAN-2-ONE,	13.46	12.40	NJ
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 2.63 (g/mL) G Lab File ID: Q2788-17RA62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
75-71-8	Dichlorodifluoromethane	12	U UJ,S
74-87-3	Chloromethane	12	U
75-01-4	Vinyl Chloride	12	U
74-83-9	Bromomethane	12	U
75-00-3	Chloroethane	12	U
75-69-4	Trichlorofluoromethane	12	U
75-35-4	1,1-Dichloroethene	12	U
75-15-0	Carbon disulfide	70	J,S
76-13-1	1,1,2-trichloro-1,2,2-triflu	12	U UJ,S
67-64-1	Acetone	290	J,S
75-09-2	Methylene Chloride	5	J B,X
156-60-5	trans-1,2-Dichloroethene	12	U UJ,S
1634-04-4	Methyl-tert-butyl ether	12	U
75-34-3	1,1-Dichloroethane	12	U
156-59-2	cis-1,2-Dichloroethene	12	U
78-93-3	2-butanone	33	J,S
67-66-3	Chloroform	12	U UJ,S
71-55-6	1,1,1-Trichloroethane	12	U
56-23-5	Carbon Tetrachloride	12	U
71-43-2	Benzene	2	J J,S
107-06-2	1,2-Dichloroethane	12	U UJ,S
79-01-6	Trichloroethene	11	J J,S
78-87-5	1,2-Dichloropropane	12	U UJ,S
75-27-4	Bromodichloromethane	12	U
10061-01-5	cis-1,3-Dichloropropene	12	U
108-10-1	4-Methyl-2-pentanone	28	J J,S
108-88-3	Toluene	49	B
10061-02-6	trans-1,3-Dichloropropene	12	U UJ,S
79-00-5	1,1,2-Trichloroethane	12	U
127-18-4	Tetrachloroethene	12	U
591-78-6	2-hexanone	30	U
124-48-1	Dibromochloromethane	12	U
106-93-4	1,2-Dibromoethane	12	U

Do not use RA

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 2.63 (g/mL) G Lab File ID: Q2788-17RA62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
108-90-7	Chlorobenzene		12	U UJ/J
100-41-4	Ethylbenzene		36	J,J
100-42-5	Styrene		12	U UJ/J
75-25-2	Bromoform		12	U
98-82-8	Isopropyl Benzene		8	J J,J
79-34-5	1,1,2,2-Tetrachloroethane		12	U UJ/J
541-73-1	1,3-Dichlorobenzene		12	U
106-46-7	1,4-Dichlorobenzene		200	J,J
95-50-1	1,2-Dichlorobenzene		12	U UJ/J
96-12-8	1,2-Dibromo-3-Chloropropane		12	U
120-82-1	1,2,4-Trichlorobenzene		2	J J,J
1330-20-7	Xylene (total)		70	
79-20-9	Methyl acetate		190	
110-82-7	Cyclohexane		12	U UJ/J
108-87-2	Methylcyclohexane		12	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB9FRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 2.63 (g/mL) G Lab File ID: Q2788-17RA62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	74-93-1	METHANETHIOL	0.95	84.19	NJ
2.	500-00-5	CYCLOHEXENE, 4-METHYL-1-(1-M	4.49	85.27	NJ
3.	98-82-8	BENZENE, (1-METHYLETHYL)-	4.54	12.39	NJ
4.		SUBSTITUTED BENZENE	4.59	12.80	J
5.		SUBSTITUTED BENZENE	4.68	13.39	J
6.	526-73-8	BENZENE, 1,2,3-TRIMETHYL-	4.76	25.24	NJ
7.	470-67-7	7-OXABICYCLO[2.2.1]HEPTANE,	4.81	35.09	NJ
8.	99-87-6	BENZENE, 1-METHYL-4-(1-METHY	4.87	38.54	NJ
9.	4695-62-9	BICYCLO[2.2.1]HEPTAN-2-ONE,	5.51	15.51	NJ
10.	464-49-3	BICYCLO[2.2.1]HEPTAN-2-ONE,	5.84	18.87	NJ
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 3.20(g/mL) G Lab File ID: Q2788-12B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	1	JB B,Z
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-15-0	Carbon disulfide	3	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	10	U
67-64-1	Acetone	280	B
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl-tert-butyl ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-butanone	24	J
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	8	J
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	4	J
108-88-3	Toluene	4	JB B,J
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-hexanone	25	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 3.20(g/mL) G Lab File ID: Q2788-12B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	1	J
75-25-2	Bromoform	10	U
98-82-8	Isopropyl Benzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	0.5	JB
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
1330-20-7	Xylene (total)	7	J
79-20-9	Methyl acetate	78	
110-82-7	Cyclohexane	10	U
108-87-2	Methylcyclohexane	10	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 3.20 (g/mL) G Lab File ID: Q2788-12B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	10.12	47.78	J NJ
2.	79-92-5	CAMPHENE	11.42	241.8	NJ
3.		UNKNOWN	13.48	64.30	J
4.		SUBSTITUTED BENZENE	15.67	27.27	J
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS1RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 2.42(g/mL) G Lab File ID: Q2788-12RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	13	U
74-87-3	Chloromethane	13	U
75-01-4	Vinyl Chloride	13	U
74-83-9	Bromomethane	13	U
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
75-15-0	Carbon disulfide	10	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	260	B
75-09-2	Methylene Chloride	12	JB
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl-tert-butyl ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	29	J
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
71-43-2	Benzene	1	J
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	20	
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	33	U
108-88-3	Toluene	6	JB
10061-02-6	trans-1,3-Dichloropropene	13	U
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	33	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U

DO NOT RX

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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS1RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 2.42(g/mL) G Lab File ID: Q2788-12RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	13	U
75-25-2	Bromoform	13	U
98-82-8	Isopropyl Benzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-Chloropropane	13	U
120-82-1	1,2,4-Trichlorobenzene	13	U
1330-20-7	Xylene (total)	33	J
79-20-9	Methyl acetate	38	
110-82-7	Cyclohexane	13	U
108-87-2	Methylcyclohexane	13	U

Do not cut RT

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS1RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 2.42 (g/mL) G Lab File ID: Q2788-12RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	2.99	17.71	J NJ
2.	66-25-1	HEXANAL	3.72	152.1	NJ
3.	79-92-5	CAMPHENE	4.54	15.45	NJ
4.		UNKNOWN	8.55	19.44	J
5.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 2.35(g/mL) G Lab File ID: Q2788-11B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 19 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	2	JB B12
74-87-3	Chloromethane	13	U
75-01-4	Vinyl Chloride	13	U
74-83-9	Bromomethane	13	U
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
75-15-0	Carbon disulfide	3	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	430	B
75-09-2	Methylene Chloride	5	J
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl-tert-butyl ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	25	J
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
71-43-2	Benzene	13	U
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	12	J
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	8	J JJi
108-88-3	Toluene	8	JB B14
10061-02-6	trans-1,3-Dichloropropene	13	U UJi
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	33	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U

Do not use RA

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 2.35(g/mL) G Lab File ID: Q2788-11B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 19 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	2	J
75-25-2	Bromoform	13	U
98-82-8	Isopropyl Benzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-Chloropropane	13	U
120-82-1	1,2,4-Trichlorobenzene	13	U
1330-20-7	Xylene (total)	16	J
79-20-9	Methyl acetate	49	
110-82-7	Cyclohexane	13	U
108-87-2	Methylcyclohexane	13	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 2.35 (g/mL) G Lab File ID: Q2788-11B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 19 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	10.12	20.23	JNJ
2.					
3.					
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS2RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 2.29(g/mL) G Lab File ID: Q2788-11RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 19 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	13	U
74-87-3	Chloromethane	13	U
75-01-4	Vinyl Chloride	13	U
74-83-9	Bromomethane	13	U
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	340	B B,Z
75-09-2	Methylene Chloride	14	B
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl-tert-butyl ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	39	
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
71-43-2	Benzene	13	U
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	22	
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	15	J
108-88-3	Toluene	8	JB B,J
10061-02-6	trans-1,3-Dichloropropene	13	U
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	34	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS2RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 2.29(g/mL) G Lab File ID: Q2788-11RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 19 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	13	U
75-25-2	Bromoform	13	U
98-82-8	Isopropyl Benzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-Chloropropane	13	U
120-82-1	1,2,4-Trichlorobenzene	13	U
1330-20-7	Xylene (total)	39	J
79-20-9	Methyl acetate	57	
110-82-7	Cyclohexane	13	U
108-87-2	Methylcyclohexane	13	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS2RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 2.29 (g/mL) G Lab File ID: Q2788-11RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 19 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	75-07-0	ACETALDEHYDE	0.92	14.59	NJ
2.	66-25-1	HEXANAL	3.73	63.23	NJ
3.					
4.					
5.					
6.					
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8.					
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10.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 2.99(g/mL) G Lab File ID: Q2788-10B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	1	JB B,Z
74-87-3	Chloromethane	11	U UJ,S
75-01-4	Vinyl Chloride	11	U
74-83-9	Bromomethane	11	U
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-15-0	Carbon disulfide	11	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	11	U
67-64-1	Acetone	460	B J,S
75-09-2	Methylene Chloride	2	JV
156-60-5	trans-1,2-Dichloroethene	11	U UJ,S
1634-04-4	Methyl-tert-butyl ether	11	U
75-34-3	1,1-Dichloroethane	11	U
156-59-2	cis-1,2-Dichloroethene	11	U
78-93-3	2-butanone	40	J,S
67-66-3	Chloroform	11	U UJ,S
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
71-43-2	Benzene	11	U
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	8	J J,S
78-87-5	1,2-Dichloropropane	11	U UJ,S
75-27-4	Bromodichloromethane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-10-1	4-Methyl-2-pentanone	5	J J,S
108-88-3	Toluene	4	JB B,Y
10061-02-6	trans-1,3-Dichloropropene	11	U UJ,S
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
591-78-6	2-hexanone	26	U
124-48-1	Dibromochloromethane	11	U
106-93-4	1,2-Dibromoethane	11	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 2.99(g/mL) G Lab File ID: Q2788-10B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	11	U UJ, s
100-41-4	Ethylbenzene	1	J J, s
100-42-5	Styrene	2	J
75-25-2	Bromoform	11	U UJ, s
98-82-8	Isopropyl Benzene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	11	U
95-50-1	1,2-Dichlorobenzene	11	U
96-12-8	1,2-Dibromo-3-Chloropropane	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
1330-20-7	Xylene (total)	8	J J, s
79-20-9	Methyl acetate	120	
110-82-7	Cyclohexane	11	U UJ, s
108-87-2	Methylcyclohexane	11	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 2.99 (g/mL) G Lab File ID: Q2788-10B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	3.83	14.06	J NJ
2.		UNKNOWN	10.13	11.34	J
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS3RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 3.10(g/mL) G Lab File ID: Q2788-10RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
75-71-8	Dichlorodifluoromethane		10	U UJ,S
74-87-3	Chloromethane		10	U
75-01-4	Vinyl Chloride		10	U
74-83-9	Bromomethane		10	U
75-00-3	Chloroethane		10	U
75-69-4	Trichlorofluoromethane		10	U
75-35-4	1,1-Dichloroethene		10	U
75-15-0	Carbon disulfide		10	U
76-13-1	1,1,2-trichloro-1,2,2-triflu		10	U J,S
67-64-1	Acetone		470	B
75-09-2	Methylene Chloride		10	JB B,Z
156-60-5	trans-1,2-Dichloroethene		10	U UJ,S
1634-04-4	Methyl-tert-butyl ether		10	U
75-34-3	1,1-Dichloroethane		10	U
156-59-2	cis-1,2-Dichloroethene		10	U
78-93-3	2-butanone		36	J,S
67-66-3	Chloroform		10	U UJ,S
71-55-6	1,1,1-Trichloroethane		10	U
56-23-5	Carbon Tetrachloride		10	U
71-43-2	Benzene		10	U
107-06-2	1,2-Dichloroethane		10	U
79-01-6	Trichloroethene		16	J,S
78-87-5	1,2-Dichloropropane		10	U UJ,S
75-27-4	Bromodichloromethane		10	U
10061-01-5	cis-1,3-Dichloropropene		10	U
108-10-1	4-Methyl-2-pentanone		26	U
108-88-3	Toluene		6	JB B,J
10061-02-6	trans-1,3-Dichloropropene		10	U UJ,S
79-00-5	1,1,2-Trichloroethane		10	U
127-18-4	Tetrachloroethene		10	U
591-78-6	2-hexanone		26	U
124-48-1	Dibromochloromethane		10	U
106-93-4	1,2-Dibromoethane		10	U

DO 10X
USE
FX

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS3RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 3.10(g/mL) G Lab File ID: Q2788-10RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	10	U UJ,S
100-41-4	Ethylbenzene	3	J J,S
100-42-5	Styrene	10	U UJ,S
75-25-2	Bromoform	10	U
98-82-8	Isopropyl Benzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
1330-20-7	Xylene (total)	36	J,S
79-20-9	Methyl acetate	110	↓
110-82-7	Cyclohexane	10	U UJ,S
108-87-2	Methylcyclohexane	10	U ↓

Do not use RPT

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS3RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 3.10 (g/mL) G Lab File ID: Q2788-10RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 21 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	0.92	13.87	J NJ
2.		UNKNOWN	3.73	18.86	J
3.					
4.					
5.					
6.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 1.58(g/mL) G Lab File ID: Q2788-7B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 42 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
75-71-8	Dichlorodifluoromethane		4	JB J,S
74-87-3	Chloromethane		27	U UJ,S
75-01-4	Vinyl Chloride		27	U
74-83-9	Bromomethane		27	U
75-00-3	Chloroethane		27	U
75-69-4	Trichlorofluoromethane		27	U
75-35-4	1,1-Dichloroethene		27	U
75-15-0	Carbon disulfide		27	U
76-13-1	1,1,2-trichloro-1,2,2-triflu		27	U
67-64-1	Acetone		990	B J,S
75-09-2	Methylene Chloride		27	U UJ,S
156-60-5	trans-1,2-Dichloroethene		27	U
1634-04-4	Methyl-tert-butyl ether		27	U
75-34-3	1,1-Dichloroethane		27	U
156-59-2	cis-1,2-Dichloroethene		27	U
78-93-3	2-butanone		17	J J,S
67-66-3	Chloroform		27	U UJ,S
71-55-6	1,1,1-Trichloroethane		27	U
56-23-5	Carbon Tetrachloride		27	U
71-43-2	Benzene		27	U
107-06-2	1,2-Dichloroethane		27	U
79-01-6	Trichloroethene		17	J
78-87-5	1,2-Dichloropropane		27	U
75-27-4	Bromodichloromethane		27	U
10061-01-5	cis-1,3-Dichloropropene		27	U J,S
108-10-1	4-Methyl-2-pentanone		17	J
108-88-3	Toluene		12	JB B,J
10061-02-6	trans-1,3-Dichloropropene		27	U UJ,S
79-00-5	1,1,2-Trichloroethane		27	U
127-18-4	Tetrachloroethene		27	U
591-78-6	2-hexanone		68	U
124-48-1	Dibromochloromethane		27	U
106-93-4	1,2-Dibromoethane		27	U

Do not use RA

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 1.58(g/mL) G Lab File ID: Q2788-7B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 42 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	27	U UJ,S
100-41-4	Ethylbenzene	4	J J,S
100-42-5	Styrene	3	J
75-25-2	Bromoform	27	U UJ,S
98-82-8	Isopropyl Benzene	27	U
79-34-5	1,1,2,2-Tetrachloroethane	27	U
541-73-1	1,3-Dichlorobenzene	27	U
106-46-7	1,4-Dichlorobenzene	27	U
95-50-1	1,2-Dichlorobenzene	27	U
96-12-8	1,2-Dibromo-3-Chloropropane	27	U
120-82-1	1,2,4-Trichlorobenzene	27	U
1330-20-7	Xylene (total)	23	J J,S
79-20-9	Methyl acetate	56	
110-82-7	Cyclohexane	27	U UJ,S
108-87-2	Methylcyclohexane	27	U

Do not U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 1.58 (g/mL) G Lab File ID: Q2788-7B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 42 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS4RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 2.59(g/mL) G Lab File ID: Q2788-7RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 42 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
75-71-8	Dichlorodifluoromethane		17	U
74-87-3	Chloromethane		17	U
75-01-4	Vinyl Chloride		17	U
74-83-9	Bromomethane		17	U
75-00-3	Chloroethane		17	U
75-69-4	Trichlorofluoromethane		17	U
75-35-4	1,1-Dichloroethene		17	U
75-15-0	Carbon disulfide		3	J K,S
76-13-1	1,1,2-trichloro-1,2,2-triflu		17	U
67-64-1	Acetone		410	B K,S
75-09-2	Methylene Chloride		10	JB B,N
156-60-5	trans-1,2-Dichloroethene		17	U
1634-04-4	Methyl-tert-butyl ether		17	U
75-34-3	1,1-Dichloroethane		17	U
156-59-2	cis-1,2-Dichloroethene		17	U
78-93-3	2-butanone		42	U
67-66-3	Chloroform		17	U
71-55-6	1,1,1-Trichloroethane		17	U
56-23-5	Carbon Tetrachloride		17	U
71-43-2	Benzene		17	U
107-06-2	1,2-Dichloroethane		17	U
79-01-6	Trichloroethene		22	K,S
78-87-5	1,2-Dichloropropane		17	U
75-27-4	Bromodichloromethane		17	U
10061-01-5	cis-1,3-Dichloropropene		17	U
108-10-1	4-Methyl-2-pentanone		24	J K,S
108-88-3	Toluene		19	B ↓
10061-02-6	trans-1,3-Dichloropropene		17	U
79-00-5	1,1,2-Trichloroethane		17	U
127-18-4	Tetrachloroethene		17	U
591-78-6	2-hexanone		42	U
124-48-1	Dibromochloromethane		17	U
106-93-4	1,2-Dibromoethane		17	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS4RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 2.59(g/mL) G Lab File ID: Q2788-7RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 42 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	17	U
100-41-4	Ethylbenzene	11	J K15
100-42-5	Styrene	17	U
75-25-2	Bromoform	17	U
98-82-8	Isopropyl Benzene	17	U
79-34-5	1,1,2,2-Tetrachloroethane	17	U UJ i
541-73-1	1,3-Dichlorobenzene	17	U
106-46-7	1,4-Dichlorobenzene	17	U
95-50-1	1,2-Dichlorobenzene	17	U
96-12-8	1,2-Dibromo-3-Chloropropane	17	U
120-82-1	1,2,4-Trichlorobenzene	17	U
1330-20-7	Xylene (total)	82	K15
79-20-9	Methyl acetate	17	U
110-82-7	Cyclohexane	3	J K15
108-87-2	Methylcyclohexane	27	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS4RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 2.59 (g/mL) G Lab File ID: Q2788-7RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 42 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	66-25-1	HEXANAL	3.73	113.4	NJ
2.					
3.					
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 2.09(g/mL) G Lab File ID: Q2788-8B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 31 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	3	JB B,J
74-87-3	Chloromethane	3	J K,S
75-01-4	Vinyl Chloride	17	U
74-83-9	Bromomethane	17	U
75-00-3	Chloroethane	17	U
75-69-4	Trichlorofluoromethane	17	U
75-35-4	1,1-Dichloroethene	17	U
75-15-0	Carbon disulfide	17	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	17	U
67-64-1	Acetone	100	B K,S
75-09-2	Methylene Chloride	17	U
156-60-5	trans-1,2-Dichloroethene	17	U
1634-04-4	Methyl-tert-butyl ether	17	U
75-34-3	1,1-Dichloroethane	17	U
156-59-2	cis-1,2-Dichloroethene	17	U
78-93-3	2-butanone	11	J K,S
67-66-3	Chloroform	17	U
71-55-6	1,1,1-Trichloroethane	17	U
56-23-5	Carbon Tetrachloride	17	U
71-43-2	Benzene	17	U
107-06-2	1,2-Dichloroethane	17	U
79-01-6	Trichloroethene	12	J K,S
78-87-5	1,2-Dichloropropane	17	U
75-27-4	Bromodichloromethane	17	U
10061-01-5	cis-1,3-Dichloropropene	17	U
108-10-1	4-Methyl-2-pentanone	5	J K,S
108-88-3	Toluene	5	JB B,J
10061-02-6	trans-1,3-Dichloropropene	17	U
79-00-5	1,1,2-Trichloroethane	17	U
127-18-4	Tetrachloroethene	17	U
591-78-6	2-hexanone	43	U
124-48-1	Dibromochloromethane	17	U
106-93-4	1,2-Dibromoethane	17	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 2.09(g/mL) G Lab File ID: Q2788-8B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 31 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	17	U
100-41-4	Ethylbenzene	2	J K1S
100-42-5	Styrene	2	J ↓
75-25-2	Bromoform	17	U
98-82-8	Isopropyl Benzene	17	U
79-34-5	1,1,2,2-Tetrachloroethane	17	U
541-73-1	1,3-Dichlorobenzene	0.9	J K1S
106-46-7	1,4-Dichlorobenzene	1	JB B1E
95-50-1	1,2-Dichlorobenzene	0.8	JB ↓
96-12-8	1,2-Dibromo-3-Chloropropane	17	U
120-82-1	1,2,4-Trichlorobenzene	17	U
1330-20-7	Xylene (total)	7	J K1S
79-20-9	Methyl acetate	36	↓
110-82-7	Cyclohexane	17	U
108-87-2	Methylcyclohexane	17	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 2.09 (g/mL) G Lab File ID: Q2788-8B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 31 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~11.25~~	~~33.41~~	~~JB~~
2.		~~LABORATORY ARTIFACT~~	~~12.38~~	~~28.96~~	~~JB~~
3.					
4.					
5.					
6.					
7.					
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9.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS5RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 2.72(g/mL) G Lab File ID: Q2788-8RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 31 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
75-71-8	Dichlorodifluoromethane	13	U	UJ,S
74-87-3	Chloromethane	13	U	
75-01-4	Vinyl Chloride	13	U	
74-83-9	Bromomethane	13	U	
75-00-3	Chloroethane	13	U	
75-69-4	Trichlorofluoromethane	13	U	
75-35-4	1,1-Dichloroethene	13	U	
75-15-0	Carbon disulfide	2	J	J,S
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U	UJ,S
67-64-1	Acetone	120	B	B,Z
75-09-2	Methylene Chloride	8	JB	
156-60-5	trans-1,2-Dichloroethene	13	U	UJ,S
1634-04-4	Methyl-tert-butyl ether	13	U	
75-34-3	1,1-Dichloroethane	13	U	
156-59-2	cis-1,2-Dichloroethene	13	U	
78-93-3	2-butanone	33	U	
67-66-3	Chloroform	13	U	
71-55-6	1,1,1-Trichloroethane	13	U	
56-23-5	Carbon Tetrachloride	13	U	
71-43-2	Benzene	13	U	
107-06-2	1,2-Dichloroethane	13	U	
79-01-6	Trichloroethene	20		J,S
78-87-5	1,2-Dichloropropane	13	U	UJ,S
75-27-4	Bromodichloromethane	13	U	
10061-01-5	cis-1,3-Dichloropropene	13	U	
108-10-1	4-Methyl-2-pentanone	39		J,S
108-88-3	Toluene	17	B	
10061-02-6	trans-1,3-Dichloropropene	13	U	UJ,S
79-00-5	1,1,2-Trichloroethane	13	U	
127-18-4	Tetrachloroethene	13	U	
591-78-6	2-hexanone	33	U	
124-48-1	Dibromochloromethane	13	U	
106-93-4	1,2-Dibromoethane	13	U	

DO not use

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS5RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 2.72 (g/mL) G Lab File ID: Q2788-8RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 31 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
108-90-7	Chlorobenzene		13	U UJ,S
100-41-4	Ethylbenzene		11	J J,S
100-42-5	Styrene		13	U UJ,S
75-25-2	Bromoform		13	U
98-82-8	Isopropyl Benzene		13	U
79-34-5	1,1,2,2-Tetrachloroethane		13	U
541-73-1	1,3-Dichlorobenzene		13	U
106-46-7	1,4-Dichlorobenzene		13	U
95-50-1	1,2-Dichlorobenzene		13	U
96-12-8	1,2-Dibromo-3-Chloropropane		13	U
120-82-1	1,2,4-Trichlorobenzene		13	U
1330-20-7	Xylene (total)		83	J,S
79-20-9	Methyl acetate		36	
110-82-7	Cyclohexane		13	U UJ,S
108-87-2	Methylcyclohexane		22	J,S

Do not use RA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS5RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 2.72 (g/mL) G Lab File ID: Q2788-8RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 31 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	66-25-1	HEXANAL	3.73	110.5	NJ
2.		LABORATORY ARTIFACT	6.86	24.32	J
3.					
4.					
5.					
6.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11A KH 3/14/03

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-4

Sample wt/vol: 2.24(g/mL) G Lab File ID: Q2788-4B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 12 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	1	JB B,Z
74-87-3	Chloromethane	13	U
75-01-4	Vinyl Chloride	13	U
74-83-9	Bromomethane	13	U
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	250	B
75-09-2	Methylene Chloride	6	J
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl-tert-butyl ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	46	
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
71-43-2	Benzene	1	J
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	8	J
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	3	J
108-88-3	Toluene	3	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	13	U
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	32	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11A
KH 3/14/03

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-4

Sample wt/vol: 2.24(g/mL) G Lab File ID: Q2788-4B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 12 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
100-42-5	Styrene	1	J
75-25-2	Bromoform	13	U
98-82-8	Isopropyl Benzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-Chloropropane	13	U
120-82-1	1,2,4-Trichlorobenzene	13	U
1330-20-7	Xylene (total)	5	J
79-20-9	Methyl acetate	13	U
110-82-7	Cyclohexane	13	U
108-87-2	Methylcyclohexane	13	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SB11A KH 3/14/03

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-4

Sample wt/vol: 2.24 (g/mL) G Lab File ID: Q2788-4B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 12 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	10.12	17.20	J NJ
2.					
3.					
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 3.43 (g/mL) G Lab File ID: Q2788-9B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 8 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	U
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	2	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	8	U
67-64-1	Acetone	140	B
75-09-2	Methylene Chloride	8	U
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	17	J
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	8	U
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	6	J
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	2	J
108-88-3	Toluene	2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	20	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 3.43(g/mL) G Lab File ID: Q2788-9B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 8 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	8	U
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U UJ
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	3	J
79-20-9	Methyl acetate	8	U
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 3.43 (g/mL) G Lab File ID: Q2788-9B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 8 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	10.12	14.57	J NJ
2.					
3.					
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS11RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 5.67(g/mL) G Lab File ID: Q2788-9RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 8 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	2	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	94	B
75-09-2	Methylene Chloride	4	JB
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	8	J
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	6	
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	7	J
108-88-3	Toluene	4	JB
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	12	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

Do not use RA

B,Z

B,Z

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS11RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 5.67(g/mL) G Lab File ID: Q2788-9RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 8 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	20	
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SS11RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 5.67 (g/mL) G Lab File ID: Q2788-9RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 8 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-5

Sample wt/vol: 2.10(g/mL) G Lab File ID: Q2788-5RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 14 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	14	U
74-87-3	Chloromethane	14	U
75-01-4	Vinyl Chloride	14	U
74-83-9	Bromomethane	14	U
75-00-3	Chloroethane	14	U
75-69-4	Trichlorofluoromethane	14	U
75-35-4	1,1-Dichloroethene	14	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	14	U
67-64-1	Acetone	120	B B,Z
75-09-2	Methylene Chloride	13	JB
156-60-5	trans-1,2-Dichloroethene	14	U
1634-04-4	Methyl-tert-butyl ether	14	U
75-34-3	1,1-Dichloroethane	14	U
156-59-2	cis-1,2-Dichloroethene	14	U
78-93-3	2-butanone	16	J
67-66-3	Chloroform	14	U
71-55-6	1,1,1-Trichloroethane	14	U
56-23-5	Carbon Tetrachloride	14	U
71-43-2	Benzene	14	U
107-06-2	1,2-Dichloroethane	14	U
79-01-6	Trichloroethene	17	
78-87-5	1,2-Dichloropropane	14	U
75-27-4	Bromodichloromethane	14	U
10061-01-5	cis-1,3-Dichloropropene	14	U
108-10-1	4-Methyl-2-pentanone	11	J
108-88-3	Toluene	9	JB B,Y
10061-02-6	trans-1,3-Dichloropropene	14	U
79-00-5	1,1,2-Trichloroethane	14	U
127-18-4	Tetrachloroethene	14	U
591-78-6	2-hexanone	35	U
124-48-1	Dibromochloromethane	14	U
106-93-4	1,2-Dibromoethane	14	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-5

Sample wt/vol: 2.10(g/mL) G Lab File ID: Q2788-5RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 14 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	14	U
100-41-4	Ethylbenzene	4	J
100-42-5	Styrene	14	U
75-25-2	Bromoform	14	U
98-82-8	Isopropyl Benzene	14	U
79-34-5	1,1,2,2-Tetrachloroethane	14	U
541-73-1	1,3-Dichlorobenzene	14	U
106-46-7	1,4-Dichlorobenzene	14	U
95-50-1	1,2-Dichlorobenzene	14	U
96-12-8	1,2-Dibromo-3-Chloropropane	14	U
120-82-1	1,2,4-Trichlorobenzene	14	U
1330-20-7	Xylene (total)	49	
79-20-9	Methyl acetate	14	U
110-82-7	Cyclohexane	3	J
108-87-2	Methylcyclohexane	22	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-5

Sample wt/vol: 2.10 (g/mL) G Lab File ID: Q2788-5RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 14 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-1

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 2.58(g/mL) G Lab File ID: Q2788-6B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 12 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	2	JB
74-87-3	Chloromethane	3	J
75-01-4	Vinyl Chloride	11	U
74-83-9	Bromomethane	11	U
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-15-0	Carbon disulfide	5	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	11	U
67-64-1	Acetone	220	B
75-09-2	Methylene Chloride	11	U
156-60-5	trans-1,2-Dichloroethene	11	U
1634-04-4	Methyl-tert-butyl ether	11	U
75-34-3	1,1-Dichloroethane	11	U
156-59-2	cis-1,2-Dichloroethene	11	U
78-93-3	2-butanone	15	J
67-66-3	Chloroform	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
71-43-2	Benzene	2	J
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	8	J
78-87-5	1,2-Dichloropropane	11	U
75-27-4	Bromodichloromethane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-10-1	4-Methyl-2-pentanone	7	J
108-88-3	Toluene	6	JB
10061-02-6	trans-1,3-Dichloropropene	11	U
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
591-78-6	2-hexanone	28	U
124-48-1	Dibromochloromethane	11	U
106-93-4	1,2-Dibromoethane	11	U

Do not use RA

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-1

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 2.58(g/mL) G Lab File ID: Q2788-6B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 12 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	2	J K,S
100-42-5	Styrene	2	J
75-25-2	Bromoform	11	U
98-82-8	Isopropyl Benzene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	0.9	JB
95-50-1	1,2-Dichlorobenzene	0.6	JB
96-12-8	1,2-Dibromo-3-Chloropropane	11	U
120-82-1	1,2,4-Trichlorobenzene	0.9	JB
1330-20-7	Xylene (total)	14	J K,S
79-20-9	Methyl acetate	11	U
110-82-7	Cyclohexane	2	J
108-87-2	Methylcyclohexane	1	J

DO NOT USE

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-1

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 2.58 (g/mL) G Lab File ID: Q2788-6B71

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 12 Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-1RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 1.59(g/mL) G Lab File ID: Q2788-6RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 12 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	18	U
74-87-3	Chloromethane	18	U
75-01-4	Vinyl Chloride	18	U
74-83-9	Bromomethane	18	U
75-00-3	Chloroethane	18	U
75-69-4	Trichlorofluoromethane	18	U
75-35-4	1,1-Dichloroethene	18	U
75-15-0	Carbon disulfide	11	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	18	U
67-64-1	Acetone	160	B
75-09-2	Methylene Chloride	18	B,U
156-60-5	trans-1,2-Dichloroethene	18	U
1634-04-4	Methyl-tert-butyl ether	18	U
75-34-3	1,1-Dichloroethane	18	U
156-59-2	cis-1,2-Dichloroethene	18	U
78-93-3	2-butanone	17	J
67-66-3	Chloroform	18	U
71-55-6	1,1,1-Trichloroethane	18	U
56-23-5	Carbon Tetrachloride	18	U
71-43-2	Benzene	6	J
107-06-2	1,2-Dichloroethane	18	U
79-01-6	Trichloroethene	25	
78-87-5	1,2-Dichloropropane	18	U
75-27-4	Bromodichloromethane	18	U
10061-01-5	cis-1,3-Dichloropropene	18	U
108-10-1	4-Methyl-2-pentanone	21	J
108-88-3	Toluene	16	JB
10061-02-6	trans-1,3-Dichloropropene	18	U
79-00-5	1,1,2-Trichloroethane	18	U
127-18-4	Tetrachloroethene	18	U
591-78-6	2-hexanone	45	U
124-48-1	Dibromochloromethane	18	U
106-93-4	1,2-Dibromoethane	18	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-1RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 1.59(g/mL) G Lab File ID: Q2788-6RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 12 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	18	U
100-41-4	Ethylbenzene	6	J
100-42-5	Styrene	18	U
75-25-2	Bromoform	18	U
98-82-8	Isopropyl Benzene	18	U
79-34-5	1,1,2,2-Tetrachloroethane	18	U UJ
541-73-1	1,3-Dichlorobenzene	18	U
106-46-7	1,4-Dichlorobenzene	18	U
95-50-1	1,2-Dichlorobenzene	18	U
96-12-8	1,2-Dibromo-3-Chloropropane	18	U
120-82-1	1,2,4-Trichlorobenzene	18	U UJ
1330-20-7	Xylene (total)	72	
79-20-9	Methyl acetate	18	U
110-82-7	Cyclohexane	5	J
108-87-2	Methylcyclohexane	31	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-1RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 1.59 (g/mL) G Lab File ID: Q2788-6RA62

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. 12 Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-14B64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-14B64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	840	U
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	840	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	U UJ,Y
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	420	U UJ,C
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	U UJ,C
206-44-0	Fluoranthene	420	U
129-00-0	Pyrene	420	U
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	51	J
56-55-3	Benzo(a)anthracene	420	U
218-01-9	Chrysene	420	U
117-84-0	Di-n-octylphthalate	420	U
205-99-2	Benzo(b)fluoranthene	420	U
207-08-9	Benzo(k)fluoranthene	420	U
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	420	U
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	420	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-14B64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~ (BC)	5.47	640	~~JB~~
2.		UNKNOWN (BC)	5.76	1300	JB
3.		UNKNOWN (BC)	6.95	190	JB
4.		UNKNOWN (BC)	7.06	340	JB
5.		~~UNKNOWN~~	21.98	170	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-15JA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: 27 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	450	U
108-95-2	Phenol	450	U
111-44-4	Bis(2-chloroethyl)ether	450	U
95-57-8	2-Chlorophenol	450	U
95-48-7	2-Methylphenol	450	U
108-60-1	2,2'-oxybis(1-Chloropropane)	450	U
98-86-2	Acetophenone	450	U
106-44-5	4-Methylphenol	450	U
621-64-7	N-Nitroso-di-N-propylamine	450	U
67-72-1	Hexachloroethane	450	U
98-95-3	Nitrobenzene	450	U
78-59-1	Isophorone	450	U
88-75-5	2-Nitrophenol	450	U
105-67-9	2,4-Dimethylphenol	450	U
111-91-1	Bis(2-chloroethoxy)methane	450	U
120-83-2	2,4-Dichlorophenol	450	U
91-20-3	Naphthalene	450	U
106-47-8	4-Chloroaniline	450	U
87-68-3	Hexachlorobutadiene	450	U
105-60-2	Caprolactam	450	U
59-50-7	4-Chloro-3-methylphenol	450	U
91-57-6	2-Methylnaphthalene	450	U
77-47-4	Hexachlorocyclopentadiene	450	U
88-06-2	2,4,6-Trichlorophenol	450	U
95-95-4	2,4,5-Trichlorophenol	450	U
92-52-4	1,1'-Biphenyl	450	U
91-58-7	2-Chloronaphthalene	450	U
88-74-4	2-Nitroaniline	900	U
131-11-3	Dimethylphthalate	450	U
606-20-2	2,6-Dinitrotoluene	450	U
208-96-8	Acenaphthylene	450	U
99-09-2	3-Nitroaniline	900	U
83-32-9	Acenaphthene	450	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-15JA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: 27 decanted: (Y/N) N Date Extracted: 11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2300	U
100-02-7	4-Nitrophenol	900	U
121-14-2	2,4-Dinitrotoluene	450	U
132-64-9	Dibenzofuran	450	U
84-66-2	Diethylphthalate	450	U
7005-72-3	4-Chlorophenyl-phenylether	450	U
86-73-7	Fluorene	450	U
100-01-6	4-Nitroaniline	900	U
534-52-1	4,6-Dinitro-2-methylphenol	900	U
86-30-6	N-Nitrosodiphenylamine (1)	900	U
101-55-3	4-Bromophenyl-phenylether	450	U
118-74-1	Hexachlorobenzene	450	U
1912-24-9	Atrazine	450	UJ
87-86-5	Pentachlorophenol	450	U
85-01-8	Phenanthrene	450	U
120-12-7	Anthracene	450	U
86-74-8	Carbazole	450	U
84-74-2	Di-n-butylphthalate	450	U
206-44-0	Fluoranthene	450	U
129-00-0	Pyrene	35	J
85-68-7	Butylbenzylphthalate	450	U
91-94-1	3,3'-Dichlorobenzidine	450	U
117-81-7	bis(2-ethylhexyl)Phthalate	350	J
56-55-3	Benzo(a)anthracene	450	U
218-01-9	Chrysene	450	U
117-84-0	Di-n-octylphthalate	450	U
205-99-2	Benzo(b)fluoranthene	450	U
207-08-9	Benzo(k)fluoranthene	450	U
50-32-8	Benzo(a)pyrene	450	U
193-39-5	Indeno(1,2,3-cd)pyrene	450	U
53-70-3	Dibenzo(a,h)anthracene	450	U
191-24-2	Benzo(g,h,i)perylene	450	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-15JA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: 27 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	79-34-5	ETHANE, 1,1,2,2-TETRACHLORO-	5.44	370	NJ
2.		UNKNOWN (BC)	5.48	760	JB
3.		UNKNOWN (BC)	5.76	1500	JB
4.		UNKNOWN (BC)	6.95	190	JB
5.		UNKNOWN (BC)	7.02	210	JB
6.		UNKNOWN (BC)	7.07	230	JB
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-13B64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-13B64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	780	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	780	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	UUJ,r
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	UUJ,c
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	32	J J,c
206-44-0	Fluoranthene	24	J
129-00-0	Pyrene	29	J
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	68	J
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-13B64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 11

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~ (BC)	5.47	380	JB
2.		UNKNOWN (BC)	5.76	700	JB
3.		UNKNOWN	10.12	1200	J
4.		~~UNKNOWN~~	11.87	540	J
5.	10544-50-0	SULFUR, MOL. (S8)	14.37	7800	NJ
6.		STRAIGHT-CHAIN ALKANE	19.04	170	J
7.		STRAIGHT-CHAIN ALKANE	19.58	190	J
8.		~~UNKNOWN~~	22.34	470	J
9.		UNKNOWN	23.27	2900	J
10.		UNKNOWN	23.34	680	J
11.		UNKNOWN	23.62	480	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-1A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-1A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	780	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	780	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U UJ JV
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl) Phthalate	38	J
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	26	J
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-1A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~ (BC)	5.51	390	JB
2.		UNKNOWN (BC)	5.78	1400	JB
3.		~~UNKNOWN~~ (BC)	7.08	160	JB
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RA 2/5/03

FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-2A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 26 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	450	U
108-95-2	Phenol	450	U
111-44-4	Bis(2-chloroethyl)ether	450	U
95-57-8	2-Chlorophenol	450	U
95-48-7	2-Methylphenol	450	U
108-60-1	2,2'-oxybis(1-Chloropropane)	450	U
98-86-2	Acetophenone	450	U
106-44-5	4-Methylphenol	450	U
621-64-7	N-Nitroso-di-N-propylamine	450	U
67-72-1	Hexachloroethane	450	U
98-95-3	Nitrobenzene	450	U
78-59-1	Isophorone	450	U
88-75-5	2-Nitrophenol	450	U
105-67-9	2,4-Dimethylphenol	450	U
111-91-1	Bis(2-chloroethoxy)methane	450	U
120-83-2	2,4-Dichlorophenol	450	U
91-20-3	Naphthalene	450	U
106-47-8	4-Chloroaniline	450	U
87-68-3	Hexachlorobutadiene	450	U
105-60-2	Caprolactam	450	U
59-50-7	4-Chloro-3-methylphenol	450	U
91-57-6	2-Methylnaphthalene	450	U
77-47-4	Hexachlorocyclopentadiene	450	U
88-06-2	2,4,6-Trichlorophenol	450	U
95-95-4	2,4,5-Trichlorophenol	450	U
92-52-4	1,1'-Biphenyl	450	U
91-58-7	2-Chloronaphthalene	450	U
88-74-4	2-Nitroaniline	890	U
131-11-3	Dimethylphthalate	450	U
606-20-2	2,6-Dinitrotoluene	450	U
208-96-8	Acenaphthylene	450	U
99-09-2	3-Nitroaniline	890	U
83-32-9	Acenaphthene	450	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-2A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 26 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	890	U
121-14-2	2,4-Dinitrotoluene	450	U
132-64-9	Dibenzofuran	450	U
84-66-2	Diethylphthalate	450	U
7005-72-3	4-Chlorophenyl-phenylether	450	U
86-73-7	Fluorene	450	U
100-01-6	4-Nitroaniline	890	U
534-52-1	4,6-Dinitro-2-methylphenol	890	U
86-30-6	N-Nitrosodiphenylamine (1)	890	U
101-55-3	4-Bromophenyl-phenylether	450	U
118-74-1	Hexachlorobenzene	450	U
1912-24-9	Atrazine	450	UUJ|V
87-86-5	Pentachlorophenol	450	U
85-01-8	Phenanthrene	450	U
120-12-7	Anthracene	450	U
86-74-8	Carbazole	450	U
84-74-2	Di-n-butylphthalate	450	U
206-44-0	Fluoranthene	450	U
129-00-0	Pyrene	450	U
85-68-7	Butylbenzylphthalate	450	U
91-94-1	3,3'-Dichlorobenzidine	450	U
117-81-7	bis(2-ethylhexyl)Phthalate	450	U
56-55-3	Benzo(a)anthracene	450	U
218-01-9	Chrysene	450	U
117-84-0	Di-n-octylphthalate	450	U
205-99-2	Benzo(b)fluoranthene	450	U
207-08-9	Benzo(k)fluoranthene	450	U
50-32-8	Benzo(a)pyrene	450	U
193-39-5	Indeno(1,2,3-cd)pyrene	450	U
53-70-3	Dibenzo(a,h)anthracene	450	U
191-24-2	Benzo(g,h,i)perylene	450	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-2A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 26 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	570	JB
2.		UNKNOWN (BC)	5.78	1800	JB
3.		UNKNOWN (BC)	6.95	190	JB
4.		UNKNOWN (BC)	7.07	220	JB
5.		UNKNOWN	7.54	180	J
6.					
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RA 2/5/03

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-3A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 39 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	540	U
108-95-2	Phenol	540	U
111-44-4	Bis(2-chloroethyl)ether	540	U
95-57-8	2-Chlorophenol	540	U
95-48-7	2-Methylphenol	540	U
108-60-1	2,2'-oxybis(1-Chloropropane)	540	U
98-86-2	Acetophenone	540	U
106-44-5	4-Methylphenol	540	U
621-64-7	N-Nitroso-di-N-propylamine	540	U
67-72-1	Hexachloroethane	540	U
98-95-3	Nitrobenzene	540	U
78-59-1	Isophorone	540	U
88-75-5	2-Nitrophenol	540	U
105-67-9	2,4-Dimethylphenol	540	U
111-91-1	Bis(2-chloroethoxy)methane	540	U
120-83-2	2,4-Dichlorophenol	540	U
91-20-3	Naphthalene	540	U
106-47-8	4-Chloroaniline	540	U
87-68-3	Hexachlorobutadiene	540	U
105-60-2	Caprolactam	540	U
59-50-7	4-Chloro-3-methylphenol	540	U
91-57-6	2-Methylnaphthalene	540	U
77-47-4	Hexachlorocyclopentadiene	540	U
88-06-2	2,4,6-Trichlorophenol	540	U
95-95-4	2,4,5-Trichlorophenol	540	U
92-52-4	1,1'-Biphenyl	540	U
91-58-7	2-Chloronaphthalene	540	U
88-74-4	2-Nitroaniline	1100	U
131-11-3	Dimethylphthalate	540	U
606-20-2	2,6-Dinitrotoluene	540	U
208-96-8	Acenaphthylene	540	U
99-09-2	3-Nitroaniline	1100	U
83-32-9	Acenaphthene	540	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-3A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 39 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2700	U
100-02-7	4-Nitrophenol	1100	U
121-14-2	2,4-Dinitrotoluene	540	U
132-64-9	Dibenzofuran	540	U
84-66-2	Diethylphthalate	540	U
7005-72-3	4-Chlorophenyl-phenylether	540	U
86-73-7	Fluorene	540	U
100-01-6	4-Nitroaniline	1100	U
534-52-1	4,6-Dinitro-2-methylphenol	1100	U
86-30-6	N-Nitrosodiphenylamine (1)	1100	U
101-55-3	4-Bromophenyl-phenylether	540	U
118-74-1	Hexachlorobenzene	540	U
1912-24-9	Atrazine	540	UUJV
87-86-5	Pentachlorophenol	540	U
85-01-8	Phenanthrene	540	U
120-12-7	Anthracene	540	U
86-74-8	Carbazole	540	U
84-74-2	Di-n-butylphthalate	540	U
206-44-0	Fluoranthene	540	U
129-00-0	Pyrene	540	U
85-68-7	Butylbenzylphthalate	540	U
91-94-1	3,3'-Dichlorobenzidine	540	U
117-81-7	bis(2-ethylhexyl)Phthalate	540	U
56-55-3	Benzo(a)anthracene	540	U
218-01-9	Chrysene	540	U
117-84-0	Di-n-octylphthalate	540	U
205-99-2	Benzo(b)fluoranthene	540	U
207-08-9	Benzo(k)fluoranthene	540	U
50-32-8	Benzo(a)pyrene	540	U
193-39-5	Indeno(1,2,3-cd)pyrene	540	U
53-70-3	Dibenzo(a,h)anthracene	540	U
191-24-2	Benzo(g,h,i)perylene	540	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-3A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 39 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.51	500	JB
2.		UNKNOWN (BC)	5.78	1900	JB
3.		UNKNOWN	7.55	240	J
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-19B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-19B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 19 decanted: (Y/N) N Date Extracted: 11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	810	U
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	810	U
534-52-1	4,6-Dinitro-2-methylphenol	810	U
86-30-6	N-Nitrosodiphenylamine (1)	810	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	U UJ,Y
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	160	J J,Y
120-12-7	Anthracene	47	J
86-74-8	Carbazole	47	J
84-74-2	Di-n-butylphthalate	410	U UJ,C
206-44-0	Fluoranthene	430	
129-00-0	Pyrene	330	J
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	80	J
56-55-3	Benzo(a)anthracene	270	J
218-01-9	Chrysene	270	J J,Y
117-84-0	Di-n-octylphthalate	410	U
205-99-2	Benzo(b)fluoranthene	180	J
207-08-9	Benzo(k)fluoranthene	260	J J,Y
50-32-8	Benzo(a)pyrene	200	J
193-39-5	Indeno(1,2,3-cd)pyrene	140	J
53-70-3	Dibenzo(a,h)anthracene	68	J J,Y
191-24-2	Benzo(g,h,i)perylene	110	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-19B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.48~~	~~510~~	JB
2.		UNKNOWN (BC)	5.76	1200	JB
3.		UNKNOWN (BC)	6.93	180	JB
4.		BENZOFLUORANTHENE	20.13	240	J
5.		UNKNOWN PAH	21.99	180	J
6.					
7.					
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9.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-20B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-20B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	840	U
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	78	J
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	840	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	UUJ,Y
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	73	JJ,Y
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	UUJ,C
206-44-0	Fluoranthene	50	J
129-00-0	Pyrene	84	J
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	590	
56-55-3	Benzo(a)anthracene	420	U
218-01-9	Chrysene	46	JJ,Y
117-84-0	Di-n-octylphthalate	420	U
205-99-2	Benzo(b)fluoranthene	420	U
207-08-9	Benzo(k)fluoranthene	420	U
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	420	U
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	65	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-20B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.76	1100	JB
2.	7704-34-9	SULFUR	14.42	17000	NJ
3.		UNKNOWN	14.82	12000	J
4.		STRAIGHT-CHAIN ALKANE	15.52	1200	J
5.		BRANCHED ALKANE	15.84	1400	J
6.		~~UNKNOWN~~ PAH	15.92	2200	J
7.		BRANCHED ALKANE	16.38	2100	J
8.		STRAIGHT-CHAIN ALKANE	17.14	2800	J
9.		STRAIGHT-CHAIN ALKANE	18.48	4100	J
10.		STRAIGHT-CHAIN ALKANE	18.82	1900	J
11.		STRAIGHT-CHAIN ALKANE	19.05	2800	J
12.		STRAIGHT-CHAIN ALKANE	20.12	2600	J
13.		UNKNOWN ALKANE	20.49	3100	J
14.		STRAIGHT-CHAIN ALKANE	20.61	2700	J
15.		BRANCHED ALKANE	21.08	1700	J
16.		BRANCHED ALKANE	21.54	2200	J
17.		~~UNKNOWN~~	22.30	1800	J
18.		STRAIGHT-CHAIN ALKANE	22.37	2600	J
19.		~~UNKNOWN~~	23.60	1600	J
20.		UNKNOWN	23.74	4300	J
21.					
22.					
23.					
24.					
25.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-16B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-16B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	800	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U UJ,r
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U UJ,c
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U UJ,c
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	57	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-16B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.47	540	JB
2.		UNKNOWN (BC)	5.76	1200	JB
3.		UNKNOWN (BC)	6.95	190	JB
4.		UNKNOWN (BC)	7.06	170	JB
5.					
6.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-18B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 23 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	430	U
108-95-2	Phenol	430	U
111-44-4	Bis(2-chloroethyl)ether	430	U
95-57-8	2-Chlorophenol	430	U
95-48-7	2-Methylphenol	430	U
108-60-1	2,2'-oxybis(1-Chloropropane)	430	U
98-86-2	Acetophenone	430	U
106-44-5	4-Methylphenol	430	U
621-64-7	N-Nitroso-di-N-propylamine	430	U
67-72-1	Hexachloroethane	430	U
98-95-3	Nitrobenzene	430	U
78-59-1	Isophorone	430	U
88-75-5	2-Nitrophenol	430	U
105-67-9	2,4-Dimethylphenol	430	U
111-91-1	Bis(2-chloroethoxy)methane	430	U
120-83-2	2,4-Dichlorophenol	430	U
91-20-3	Naphthalene	430	U
106-47-8	4-Chloroaniline	430	U
87-68-3	Hexachlorobutadiene	430	U
105-60-2	Caprolactam	430	U
59-50-7	4-Chloro-3-methylphenol	430	U
91-57-6	2-Methylnaphthalene	430	U
77-47-4	Hexachlorocyclopentadiene	430	U
88-06-2	2,4,6-Trichlorophenol	430	U
95-95-4	2,4,5-Trichlorophenol	430	U
92-52-4	1,1'-Biphenyl	430	U
91-58-7	2-Chloronaphthalene	430	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	430	U
606-20-2	2,6-Dinitrotoluene	430	U
208-96-8	Acenaphthylene	430	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	430	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-18B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 23 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	860	U
121-14-2	2,4-Dinitrotoluene	430	U
132-64-9	Dibenzofuran	430	U
84-66-2	Diethylphthalate	430	U
7005-72-3	4-Chlorophenyl-phenylether	430	U
86-73-7	Fluorene	430	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	860	U
101-55-3	4-Bromophenyl-phenylether	430	U
118-74-1	Hexachlorobenzene	430	U
1912-24-9	Atrazine	430	UUJ,r
87-86-5	Pentachlorophenol	430	U
85-01-8	Phenanthrene	430	UUJ,c
120-12-7	Anthracene	430	U
86-74-8	Carbazole	430	U
84-74-2	Di-n-butylphthalate	430	UUJ,c
206-44-0	Fluoranthene	430	U
129-00-0	Pyrene	430	U
85-68-7	Butylbenzylphthalate	430	U
91-94-1	3,3'-Dichlorobenzidine	430	U
117-81-7	bis(2-ethylhexyl)Phthalate	430	U
56-55-3	Benzo(a)anthracene	430	U
218-01-9	Chrysene	430	U
117-84-0	Di-n-octylphthalate	430	U
205-99-2	Benzo(b)fluoranthene	430	U
207-08-9	Benzo(k)fluoranthene	430	U
50-32-8	Benzo(a)pyrene	430	U
193-39-5	Indeno(1,2,3-cd)pyrene	430	U
53-70-3	Dibenzo(a,h)anthracene	430	U
191-24-2	Benzo(g,h,i)perylene	430	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-18B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 23 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~ (BC)	5.47	~~460~~	~~JB~~
2.		UNKNOWN (BC)	5.76	1100	JB
3.		UNKNOWN (BC)	7.03	290	JB
4.		~~UNKNOWN~~	10.05	~~230~~	~~J~~
5.	10544-50-0	SULFUR, MOL. (S8)	14.33	1500	NJ
6.	36653-82-4	1-HEXADECANOL	14.40	250	NJ
7.					
8.					
9.					
10.					
11.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-17RB64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/24/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U UJ,C
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U UJ,C
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	570	J,Y
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	31	J
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U UJ,C
59-50-7	4-Chloro-3-methylphenol	130	J J,Y
91-57-6	2-Methylnaphthalene	51	J
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	830	U UJ,C
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-17RB64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/24/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	830	U
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
86-30-6	N-Nitrosodiphenylamine (1)	400	J J1Y
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	U UJ1Y
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	39	J J1Y
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	86	J
206-44-0	Fluoranthene	24	J
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	370	J
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	2900	
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-octylphthalate	410	U
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-17RB64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/24/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.74~~	~~1200~~	~~JB~~
2.		STRAIGHT-CHAIN ALKANE	10.84	790	J
3.		STRAIGHT-CHAIN ALKANE	12.29	880	J
4.		STRAIGHT-CHAIN ALKANE	13.36	680	J
5.	10544-50-0	SULFUR, MOL. (S8)	14.34	13000	NJ
6.		STRAIGHT-CHAIN ALKANE	14.47	950	J
7.		BRANCHED ALKANE	15.45	1100	J
8.		STRAIGHT-CHAIN ALKANE	15.78	950	J
9.		STRAIGHT-CHAIN ALKANE	16.32	1800	J
10.		STRAIGHT-CHAIN ALKANE	17.10	2300	J
11.		BRANCHED ALKANE	17.79	3100	J
12.		BRANCHED ALKANE	18.41	3400	J
13.		STRAIGHT-CHAIN ALKANE	18.79	820	J
14.		STRAIGHT-CHAIN ALKANE	19.01	4000	J
15.		STRAIGHT-CHAIN ALKANE	19.56	3300	J
16.		STRAIGHT-CHAIN ALKANE	20.07	2800	J
17.		BRANCHED ALKANE	20.56	2100	J
18.		BRANCHED ALKANE	21.04	1600	J
19.		UNKNOWN	21.37	1200	J
20.		BRANCHED ALKANE	21.49	1800	J
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22.					
23.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-12A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-12A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	840	U
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	840	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	U UJ JY
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	56	J JJ JY
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	U
206-44-0	Fluoranthene	94	J
129-00-0	Pyrene	92	J
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	61	J
56-55-3	Benzo(a)anthracene	55	J
218-01-9	Chrysene	79	J JJ JY
117-84-0	Di-n-octylphthalate	58	J
205-99-2	Benzo(b)fluoranthene	61	J
207-08-9	Benzo(k)fluoranthene	61	J JJ JY
50-32-8	Benzo(a)pyrene	55	J
193-39-5	Indeno(1,2,3-cd)pyrene	44	J
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	44	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-12A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	740	JB
2.		UNKNOWN (BC)	5.78	1200	JB
3.		UNKNOWN	7.66	430	J
4.		UNKNOWN	7.96	380	J
5.		UNKNOWN	9.01	370	J
6.		UNKNOWN	9.25	370	J
7.		UNKNOWN	9.28	1200	J
8.		UNKNOWN	9.44	450	J
9.		UNKNOWN	9.47	370	J
10.		UNKNOWN	10.01	350	J
11.	57-10-3	HEXADECANOIC ACID	13.00	440	NJ
12.		UNKNOWN	18.67	6800	J
13.		UNKNOWN	19.57	570	J
14.		STRAIGHT-CHAIN ALKANE	20.13	690	J
15.		STRAIGHT-CHAIN ALKANE	21.09	600	J
16.		UNKNOWN	21.41	900	J
17.		UNKNOWN	22.31	440	J
18.		UNKNOWN	22.55	420	J
19.		UNKNOWN	22.68	390	J
20.		UNKNOWN	22.97	400	J
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RA 21503

FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-11A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	800	
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-11A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	810	U
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	810	U
534-52-1	4,6-Dinitro-2-methylphenol	810	U
86-30-6	N-Nitrosodiphenylamine (1)	810	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	U UJ|R
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	410	U
206-44-0	Fluoranthene	45	J
129-00-0	Pyrene	39	J
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	44	J
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	57	J J|R
117-84-0	Di-n-octylphthalate	410	U
205-99-2	Benzo(b)fluoranthene	54	J
207-08-9	Benzo(k)fluoranthene	50	J J|R
50-32-8	Benzo(a)pyrene	35	J
193-39-5	Indeno(1,2,3-cd)pyrene	31	J
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-11A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 14

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	600	JB
2.		UNKNOWN (BC)	5.78	1200	JB
3.		UNKNOWN (BC)	6.95	190	JB
4.		UNKNOWN (BC)	7.08	410	JB
5.	826-36-8	4-PIPERIDINONE, 2,2,6,6-TETR	7.47	410	NJB
6.		UNKNOWN	7.54	180	J
7.		UNKNOWN	12.90	180	J
8.	544-63-8	TETRADECANOIC ACID	13.00	410	NJ NJ
9.		UNKNOWN	19.57	450	J
10.		UNKNOWN	19.80	210	J
11.		UNKNOWN	20.14	420	J
12.		STRAIGHT-CHAIN ALKANE	21.09	340	J
13.		UNKNOWN	22.31	270	J
14.	58-22-0	TESTOSTERONE	22.97	250	NJ NJ
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-10A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-10A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	840	U
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	840	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	U UJ,r
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	32	J J,r
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	U
206-44-0	Fluoranthene	65	J
129-00-0	Pyrene	56	J
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	280	J
56-55-3	Benzo(a)anthracene	36	J
218-01-9	Chrysene	55	J J,r
117-84-0	Di-n-octylphthalate	500	
205-99-2	Benzo(b)fluoranthene	54	J
207-08-9	Benzo(k)fluoranthene	49	J J,r
50-32-8	Benzo(a)pyrene	39	J
193-39-5	Indeno(1,2,3-cd)pyrene	41	J
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	41	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-10A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.51	550	JB
2.		UNKNOWN (BC)	5.78	1100	JB
3.		UNKNOWN	7.56	340	J
4.	57-10-3	HEXADECANOIC ACID	13.00	540	NJ
5.		STRAIGHT-CHAIN ALKANE	19.06	650	J
6.	28553-12-0	1,2-BENZENEDICARBOXYLIC ACID	19.20	530	NJ
7.		UNKNOWN PHTHALATE	19.48	1100	J
8.		UNKNOWN AMIDE	19.57	840	J
9.		UNKNOWN	19.80	1100	J
10.		UNKNOWN PHTHALATE	19.86	1100	J
11.		UNKNOWN PHTHALATE	19.94	1100	J
12.		UNKNOWN PHTHALATE	20.01	700	J
13.		UNKNOWN PHTHALATE	20.07	420	J
14.		UNKNOWN	20.14	1200	J
15.		STRAIGHT-CHAIN ALKANE	21.09	430	J
16.		UNKNOWN	21.39	430	J
17.		UNKNOWN	22.05	320	J
18.		UNKNOWN	22.31	580	J
19.		UNKNOWN	22.97	540	J
20.		UNKNOWN	23.68	370	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-7A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 42 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	570	U
108-95-2	Phenol	570	U
111-44-4	Bis(2-chloroethyl)ether	570	U
95-57-8	2-Chlorophenol	570	U
95-48-7	2-Methylphenol	570	U
108-60-1	2,2'-oxybis(1-Chloropropane)	570	U
98-86-2	Acetophenone	570	U
106-44-5	4-Methylphenol	570	U
621-64-7	N-Nitroso-di-N-propylamine	570	U
67-72-1	Hexachloroethane	570	U
98-95-3	Nitrobenzene	570	U
78-59-1	Isophorone	570	U
88-75-5	2-Nitrophenol	570	U
105-67-9	2,4-Dimethylphenol	570	U
111-91-1	Bis(2-chloroethoxy)methane	570	U
120-83-2	2,4-Dichlorophenol	570	U
91-20-3	Naphthalene	54	J
106-47-8	4-Chloroaniline	570	U
87-68-3	Hexachlorobutadiene	570	U
105-60-2	Caprolactam	570	U
59-50-7	4-Chloro-3-methylphenol	570	U
91-57-6	2-Methylnaphthalene	96	J JJV
77-47-4	Hexachlorocyclopentadiene	570	U
88-06-2	2,4,6-Trichlorophenol	570	U
95-95-4	2,4,5-Trichlorophenol	570	U
92-52-4	1,1'-Biphenyl	570	U
91-58-7	2-Chloronaphthalene	570	U
88-74-4	2-Nitroaniline	1100	U
131-11-3	Dimethylphthalate	570	U
606-20-2	2,6-Dinitrotoluene	570	U
208-96-8	Acenaphthylene	160	J JJV
99-09-2	3-Nitroaniline	1100	U
83-32-9	Acenaphthene	570	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-7A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 42 decanted: (Y/N) N Date Extracted: 11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2900	U
100-02-7	4-Nitrophenol	1100	U
121-14-2	2,4-Dinitrotoluene	570	U
132-64-9	Dibenzofuran	52	J J J1Y
84-66-2	Diethylphthalate	570	U
7005-72-3	4-Chlorophenyl-phenylether	570	U
86-73-7	Fluorene	42	J J J1Y
100-01-6	4-Nitroaniline	1100	U
534-52-1	4,6-Dinitro-2-methylphenol	1100	U
86-30-6	N-Nitrosodiphenylamine (1)	1100	U
101-55-3	4-Bromophenyl-phenylether	570	U
118-74-1	Hexachlorobenzene	570	U
1912-24-9	Atrazine	570	U UJ J1Y
87-86-5	Pentachlorophenol	570	U
85-01-8	Phenanthrene	580	J J1Y
120-12-7	Anthracene	310	J
86-74-8	Carbazole	200	J
84-74-2	Di-n-butylphthalate	570	U
206-44-0	Fluoranthene	2100	
129-00-0	Pyrene	1500	
85-68-7	Butylbenzylphthalate	570	U
91-94-1	3,3'-Dichlorobenzidine	570	U
117-81-7	bis(2-ethylhexyl)Phthalate	130	J
56-55-3	Benzo(a)anthracene	540	J
218-01-9	Chrysene	1100	J J1Y
117-84-0	Di-n-octylphthalate	570	U
205-99-2	Benzo(b)fluoranthene	990	
207-08-9	Benzo(k)fluoranthene	720	J J1Y
50-32-8	Benzo(a)pyrene	330	J
193-39-5	Indeno(1,2,3-cd)pyrene	340	J
53-70-3	Dibenzo(a,h)anthracene	130	J J J1Y
191-24-2	Benzo(g,h,i)perylene	300	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-7A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 42 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 19

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.50	530	~~JB~~
2.		UNKNOWN (BC)	5.78	~~1700~~	JB
3.		UNKNOWN (BC)	7.08	~~310~~	~~JB~~
4.		~~UNKNOWN~~	~~7.45~~	~~290~~	J
5.		METHYLNAPHTHALENE	8.80	340	J NJ, E
6.		~~UNKNOWN~~	~~12.91~~	~~250~~	J
7.	57-10-3	HEXADECANOIC ACID	13.02	550	NJ
8.	84-65-1	9,10-ANTHRACENEDIONE	13.52	400	NJ
9.	10544-50-0	SULFUR, MOL. (S8)	14.35	390	NJ
10.	243-17-4	11H-BENZO[B]FLUORENE	15.89	280	NJ
11.	82-05-3	7H-BENZ[DE]ANTHRACEN-7-ONE	17.04	290	NJ
12.	82-05-3	7H-BENZ[DE]ANTHRACEN-7-ONE	17.48	240	NJ
13.		~~UNKNOWN~~	~~20.09~~	~~300~~	~~J~~
14.	192-97-2	BENZO[E]PYRENE	20.15	940	NJ NJ, E
15.		~~UNKNOWN~~	22.05	~~430~~	J
16.		UNKNOWN	~~22.32~~	800	J
17.		~~UNKNOWN KETONE~~	22.98	~~410~~	~~J~~
18.	192-65-4	NAPHTHO[1,2,3,4-DEF]CHRYSENE	23.52	300	NJ NJ, E
19.		~~UNKNOWN~~	~~23.84~~	~~290~~	~~J~~
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-8A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 31 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	480	U
108-95-2	Phenol	480	U
111-44-4	Bis(2-chloroethyl)ether	480	U
95-57-8	2-Chlorophenol	480	U
95-48-7	2-Methylphenol	480	U
108-60-1	2,2'-oxybis(1-Chloropropane)	480	U
98-86-2	Acetophenone	480	U
106-44-5	4-Methylphenol	480	U
621-64-7	N-Nitroso-di-N-propylamine	480	U
67-72-1	Hexachloroethane	480	U
98-95-3	Nitrobenzene	480	U
78-59-1	Isophorone	480	U
88-75-5	2-Nitrophenol	480	U
105-67-9	2,4-Dimethylphenol	480	U
111-91-1	Bis(2-chloroethoxy)methane	480	U
120-83-2	2,4-Dichlorophenol	480	U
91-20-3	Naphthalene	91	J
106-47-8	4-Chloroaniline	480	U
87-68-3	Hexachlorobutadiene	480	U
105-60-2	Caprolactam	480	U
59-50-7	4-Chloro-3-methylphenol	480	U
91-57-6	2-Methylnaphthalene	140	J JIV
77-47-4	Hexachlorocyclopentadiene	480	U
88-06-2	2,4,6-Trichlorophenol	480	U
95-95-4	2,4,5-Trichlorophenol	480	U
92-52-4	1,1'-Biphenyl	480	U
91-58-7	2-Chloronaphthalene	480	U
88-74-4	2-Nitroaniline	960	U
131-11-3	Dimethylphthalate	480	U
606-20-2	2,6-Dinitrotoluene	480	U
208-96-8	Acenaphthylene	28	J JIV
99-09-2	3-Nitroaniline	960	U
83-32-9	Acenaphthene	480	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-8A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 31 decanted: (Y/N) N Date Extracted: 11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2400	U
100-02-7	4-Nitrophenol	960	U
121-14-2	2,4-Dinitrotoluene	480	U
132-64-9	Dibenzofuran	56	J J|V
84-66-2	Diethylphthalate	480	U
7005-72-3	4-Chlorophenyl-phenylether	480	U
86-73-7	Fluorene	480	U
100-01-6	4-Nitroaniline	960	U
534-52-1	4,6-Dinitro-2-methylphenol	960	U
86-30-6	N-Nitrosodiphenylamine (1)	960	U
101-55-3	4-Bromophenyl-phenylether	480	U
118-74-1	Hexachlorobenzene	480	U
1912-24-9	Atrazine	480	U UJ|V
87-86-5	Pentachlorophenol	480	U
85-01-8	Phenanthrene	140	J J|V
120-12-7	Anthracene	87	J ↓
86-74-8	Carbazole	480	U
84-74-2	Di-n-butylphthalate	480	U
206-44-0	Fluoranthene	120	J
129-00-0	Pyrene	95	J
85-68-7	Butylbenzylphthalate	480	U
91-94-1	3,3'-Dichlorobenzidine	480	U
117-81-7	bis(2-ethylhexyl)Phthalate	63	J
56-55-3	Benzo(a)anthracene	60	J
218-01-9	Chrysene	140	J J|V
117-84-0	Di-n-octylphthalate	480	U
205-99-2	Benzo(b)fluoranthene	160	J
207-08-9	Benzo(k)fluoranthene	190	J J|V
50-32-8	Benzo(a)pyrene	59	J
193-39-5	Indeno(1,2,3-cd)pyrene	110	J
53-70-3	Dibenzo(a,h)anthracene	45	J J|V
191-24-2	Benzo(g,h,i)perylene	120	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-8A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 31 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 15

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.50	520	JB
2.		UNKNOWN (BC)	5.77	1000	JB
3.		UNKNOWN (BC)	7.08	240	JB
4.	90-12-0	NAPHTHALENE, 1-METHYL-	8.80	240	NJ
5.	575-37-1	NAPHTHALENE, 1,7-DIMETHYL-	9.50	220	NJ
6.		UNKNOWN	9.58	240	J
7.		BRANCHED ALKANE	10.93	340	J
8.	57-10-3	HEXADECANOIC ACID	13.01	260	NJ
9.	10544-50-0	SULFUR, MOL. (S8)	14.35	420	NJ
10.		BENZOPYRENE	20.14	280	J
11.		UNKNOWN	22.05	270	J
12.		UNKNOWN	22.32	300	J
13.		UNKNOWN	22.67	300	J
14.		UNKNOWN	22.76	220	J
15.		UNKNOWN	22.98	200	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11A
KH 3/14/03

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-4A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	33	J JJr
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	750	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	750	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11A
JGT 3/14/03

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-4A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	750	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	750	U
534-52-1	4,6-Dinitro-2-methylphenol	750	U
86-30-6	N-Nitrosodiphenylamine (1)	750	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U UJ, r
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	34	J J, r
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	23	J
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SB11A
KH 3/14/03

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-4A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.50	410	JB
2.		UNKNOWN (BC)	5.77	1500	JB
3.		UNKNOWN (BC)	7.08	230	JB
4.		UNKNOWN	8.80	280	J
5.		UNKNOWN	12.91	400	J
6.	57-10-3	HEXADECANOIC ACID	13.01	550	NJ NJ, E
7.		UNKNOWN	15.03	390	J
8.		UNKNOWN	19.80	500	J
9.		STRAIGHT-CHAIN ALKANE	20.12	470	J
10.		STRAIGHT-CHAIN ALKANE	21.08	700	J
11.		UNKNOWN	21.13	220	J
12.		UNKNOWN	21.91	370	J
13.		STRAIGHT-CHAIN ALKANE	21.98	330	J
14.		UNKNOWN	22.05	380	J
15.		UNKNOWN	22.32	970	J
16.		UNKNOWN	22.54	320	J
17.		UNKNOWN	22.67	380	J
18.	58-22-0	TESTOSTERONE	22.98	490	NJ NJ, E
19.		UNKNOWN	23.18	240	J
20.		UNKNOWN	23.65	220	J
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23.					
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27.					
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2/9/03

FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-9A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 8 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	360	U
108-95-2	Phenol	360	U
111-44-4	Bis(2-chloroethyl)ether	360	U
95-57-8	2-Chlorophenol	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
98-86-2	Acetophenone	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-di-N-propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	Bis(2-chloroethoxy)methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
105-60-2	Caprolactam	360	U
59-50-7	4-Chloro-3-methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	360	U
92-52-4	1,1'-Biphenyl	360	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	720	U
131-11-3	Dimethylphthalate	360	U
606-20-2	2,6-Dinitrotoluene	360	U
208-96-8	Acenaphthylene	360	U
99-09-2	3-Nitroaniline	720	U
83-32-9	Acenaphthene	360	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-9A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 8 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1800	U
100-02-7	4-Nitrophenol	720	U
121-14-2	2,4-Dinitrotoluene	360	U
132-64-9	Dibenzofuran	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	720	U
534-52-1	4,6-Dinitro-2-methylphenol	720	U
86-30-6	N-Nitrosodiphenylamine (1)	720	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
1912-24-9	Atrazine	360	UUJ,R
87-86-5	Pentachlorophenol	360	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-butylphthalate	360	U
206-44-0	Fluoranthene	34	J
129-00-0	Pyrene	28	J
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
117-81-7	bis(2-ethylhexyl)Phthalate	55	J
56-55-3	Benzo(a)anthracene	360	U
218-01-9	Chrysene	360	U
117-84-0	Di-n-octylphthalate	360	U
205-99-2	Benzo(b)fluoranthene	360	U
207-08-9	Benzo(k)fluoranthene	360	U
50-32-8	Benzo(a)pyrene	360	U
193-39-5	Indeno(1,2,3-cd)pyrene	360	U
53-70-3	Dibenzo(a,h)anthracene	360	U
191-24-2	Benzo(g,h,i)perylene	360	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-9A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 8 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 18

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	410	JB
2.		UNKNOWN (BC)	5.78	1400	JB
3.		UNKNOWN (BC)	6.95	150	JB
4.		UNKNOWN	7.56	150	J
5.	1120-25-8	9-HEXADECENOIC ACID, METHYL	12.92	390	NJ
6.	57-10-3	HEXADECANOIC ACID	13.00	410	NJ
7.		STRAIGHT-CHAIN ALKANE	21.09	160	J
8.		UNKNOWN	21.41	150	J
9.		UNKNOWN	21.90	230	J
10.		UNKNOWN	22.06	230	J
11.		UNKNOWN ALCOHOL	22.31	550	J
12.		UNKNOWN	22.55	240	J
13.		UNKNOWN	22.68	340	J
14.		UNKNOWN	22.77	190	J
15.		UNKNOWN	22.97	390	J
16.		UNKNOWN	23.17	220	J
17.		UNKNOWN	23.49	170	J
18.		UNKNOWN	23.65	210	J
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2/5/03

FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-5A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	63	J JIV
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	770	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	770	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-5A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	770	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	770	U
534-52-1	4,6-Dinitro-2-methylphenol	770	U
86-30-6	N-Nitrosodiphenylamine (1)	770	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	UUJ,r
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	48	JJ,r
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	22	J
129-00-0	Pyrene	32	J
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	77	J
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-5A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.51	480	JB
2.		UNKNOWN (BC)	5.78	1500	JB
3.		UNKNOWN	7.99	230	J
4.		UNKNOWN	8.79	330	J
5.		UNKNOWN	9.30	240	J
6.	57-10-3	HEXADECANOIC ACID	13.02	370	NJ
7.		UNKNOWN AMIDE	19.56	760	J
8.		STRAIGHT-CHAIN ALKANE	20.12	270	J
9.		STRAIGHT-CHAIN ALKANE	21.09	310	J
10.		UNKNOWN	21.39	240	J
11.		UNKNOWN	21.91	390	J
12.		UNKNOWN	22.05	420	J
13.		UNKNOWN	22.13	390	J
14.		UNKNOWN	22.32	1000	J
15.		UNKNOWN	22.54	370	J
16.		UNKNOWN	22.68	380	J
17.		UNKNOWN	22.98	570	J
18.		UNKNOWN	23.49	320	J
19.		UNKNOWN	23.64	290	J
20.		UNKNOWN	23.84	290	J
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22.					
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-6A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	63	JJ,r
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	750	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	750	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-6A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	750	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	750	U
534-52-1	4,6-Dinitro-2-methylphenol	750	U
86-30-6	N-Nitrosodiphenylamine (1)	750	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U UJ,Y
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	41	J J,Y
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	22	J
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	39	J
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2788-6A64

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.49	~~410~~	~~JB~~
2.		UNKNOWN (BC)	5.78	1300	JB
3.		UNKNOWN	8.79	290	J
4.		~~STRAIGHT-CHAIN ALKANE~~	10.89	~~210~~	J
5.	57-10-3	HEXADECANOIC ACID	13.00	490	NJ NJ, t
6.		UNKNOWN	19.57	550	J
7.		~~UNKNOWN~~	19.80	230	J
8.		~~STRAIGHT-CHAIN ALKANE~~	20.13	290	J
9.		STRAIGHT-CHAIN ALKANE	21.09	230	J
10.		UNKNOWN	21.39	260	J
11.		UNKNOWN	21.92	290	J
12.		UNKNOWN	22.05	430	J
13.		~~UNKNOWN~~	22.12	~~350~~	~~J~~
14.	4651-51-8	ERGOST-5-EN-3-OL, (3.BETA.)-	22.32	1000	NJ NJ, t
15.		~~UNKNOWN~~	22.54	~~370~~	~~J~~
16.		UNKNOWN	22.68	390	J
17.		UNKNOWN	22.76	~~310~~	~~J~~
18.	604-39-7	ANDROST-4-EN-3-ONE, 17-HYDRO	22.97	700	NJ NJ, t
19.		~~UNKNOWN~~	23.34	~~230~~	~~J~~
20.		UNKNOWN	23.49	330	J
21.		RA 2/5/03			
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

FORM I SV-TIC

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	53	U
83-32-9	Acenaphthene	53	U
86-73-7	Fluorene	53	U
129-00-0	Pyrene	22	U
85-01-8	Phenanthrene	53	U
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	22	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	53	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 27 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	58	U
83-32-9	Acenaphthene	58	U
86-73-7	Fluorene	58	U
129-00-0	Pyrene	18	J J,C
85-01-8	Phenanthrene	58	U
120-12-7	Anthracene	58	U
206-44-0	Fluoranthene	23	U
218-01-9	Chrysene	11	U
205-99-2	Benzo(b)fluoranthene	16	P J,C
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	12	J J,C

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	340	JPZ K,S
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	280	P K,S
218-01-9	Chrysene	2200	PZ ↓
205-99-2	Benzo(b)fluoranthene	9.8	U
207-08-9	Benzo(k)fluoranthene	9.8	U
53-70-3	Dibenzo(a,h)anthracene	9.8	U
191-24-2	Benzo(g,h,i)perylene	9.8	U
56-55-3	Benzo(a)anthracene	9.8	U
50-32-8	Benzo(a)pyrene	45	JPZ K,S
193-39-5	Indeno(1,2,3-cd)pyrene	9.8	U
208-96-8	Acenaphthylene	1300	PZ J,C

Z (Reults reported with a twenty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/14/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	12	JP J,g
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	39	P J,g
218-01-9	Chrysene	9.8	U
205-99-2	Benzo(b)fluoranthene	9.8	U
207-08-9	Benzo(k)fluoranthene	110	P J,g
53-70-3	Dibenzo(a,h)anthracene	9.8	U
191-24-2	Benzo(g,h,i)perylene	9.8	U
56-55-3	Benzo(a)anthracene	9.8	U
50-32-8	Benzo(a)pyrene	9.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.8	U
208-96-8	Acenaphthylene	49	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 26 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/14/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	57	U
83-32-9	Acenaphthene	57	U
86-73-7	Fluorene	57	U
129-00-0	Pyrene	23	U
85-01-8	Phenanthrene	57	U
120-12-7	Anthracene	57	U
206-44-0	Fluoranthene	23	U
218-01-9	Chrysene	11	U
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	57	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 39 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/14/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	69	U
83-32-9	Acenaphthene	69	U
86-73-7	Fluorene	69	U
129-00-0	Pyrene	28	U
85-01-8	Phenanthrene	69	U
120-12-7	Anthracene	69	U
206-44-0	Fluoranthene	28	U
218-01-9	Chrysene	14	U
205-99-2	Benzo(b)fluoranthene	8.4	J
207-08-9	Benzo(k)fluoranthene	14	U
53-70-3	Dibenzo(a,h)anthracene	14	U
191-24-2	Benzo(g,h,i)perylene	14	U
56-55-3	Benzo(a)anthracene	14	U
50-32-8	Benzo(a)pyrene	14	U
193-39-5	Indeno(1,2,3-cd)pyrene	14	U
208-96-8	Acenaphthylene	69	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
91-20-3	Naphthalene	78	P J,g	
83-32-9	Acenaphthene	52	U	
86-73-7	Fluorene	52	U	
129-00-0	Pyrene	67	P J,C	
85-01-8	Phenanthrene	14	J	
120-12-7	Anthracene	52	U	
206-44-0	Fluoranthene	84		
218-01-9	Chrysene	140	P	J,g
205-99-2	Benzo(b)fluoranthene	31	J,C	
207-08-9	Benzo(k)fluoranthene	29	P J,g	
53-70-3	Dibenzo(a,h)anthracene	10	U	
191-24-2	Benzo(g,h,i)perylene	10	U	
56-55-3	Benzo(a)anthracene	28		
50-32-8	Benzo(a)pyrene	14		
193-39-5	Indeno(1,2,3-cd)pyrene	180	P J,g	
208-96-8	Acenaphthylene	52	U	

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	53	U
83-32-9	Acenaphthene	6400	PZ K/S
86-73-7	Fluorene	53	U
129-00-0	Pyrene	270	JPZ K/S
85-01-8	Phenanthrene	53	U
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	22	U
218-01-9	Chrysene	11	U
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	53	U

Z (Results reported with a twenty-five fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	21	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	46	
218-01-9	Chrysene	57	P J,g
205-99-2	Benzo(b)fluoranthene	160	J,c
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	30	P J,g
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	150	P J,g
208-96-8	Acenaphthylene	51	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 23 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	54	U
83-32-9	Acenaphthene	54	U
86-73-7	Fluorene	54	U
129-00-0	Pyrene	51	PJC
85-01-8	Phenanthrene	54	U
120-12-7	Anthracene	54	U
206-44-0	Fluoranthene	22	U
218-01-9	Chrysene	11	U
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	54	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	53	U
83-32-9	Acenaphthene	6500	EP K/S
86-73-7	Fluorene	53	U
129-00-0	Pyrene	280	JPZ K/S
85-01-8	Phenanthrene	53	U
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	380	P K/S
218-01-9	Chrysene	1900	PZ ↓
205-99-2	Benzo(b)fluoranthene	95	
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	53	U

Z (Results reported with a twenty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	53	U
83-32-9	Acenaphthene	53	U
86-73-7	Fluorene	53	U
129-00-0	Pyrene	43	P K15
85-01-8	Phenanthrene	53	U
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	99	P K15
218-01-9	Chrysene	17	P
205-99-2	Benzo(b)fluoranthene	110	P
207-08-9	Benzo(k)fluoranthene	26	P
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	40	P K15
50-32-8	Benzo(a)pyrene	16	
193-39-5	Indeno(1,2,3-cd)pyrene	110	P
208-96-8	Acenaphthylene	53	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	250	JZ KJS
83-32-9	Acenaphthene	560	PZ ↓
86-73-7	Fluorene	52	U
129-00-0	Pyrene	730	Z KJS
85-01-8	Phenanthrene	550	JJC
120-12-7	Anthracene	120	JPZ KJS
206-44-0	Fluoranthene	1500	E JJC
218-01-9	Chrysene	350	Z KJS ↓
205-99-2	Benzo(b)fluoranthene	380	E
207-08-9	Benzo(k)fluoranthene	370	EP ↓
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	140	KJS
56-55-3	Benzo(a)anthracene	120	PZ ↓
50-32-8	Benzo(a)pyrene	300	Z
193-39-5	Indeno(1,2,3-cd)pyrene	250	E
208-96-8	Acenaphthylene	52	U

Z (Results reported with a five fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	160	
83-32-9	Acenaphthene	190	P J,g
86-73-7	Fluorene	53	U
129-00-0	Pyrene	230	
85-01-8	Phenanthrene	120	
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	530	EP J,g
218-01-9	Chrysene	83	P
205-99-2	Benzo(b)fluoranthene	100	
207-08-9	Benzo(k)fluoranthene	100	P J,g
53-70-3	Dibenzo(a,h)anthracene	25	P
191-24-2	Benzo(g,h,i)perylene	110	P
56-55-3	Benzo(a)anthracene	83	P
50-32-8	Benzo(a)pyrene	62	P
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	53	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 42 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	1100	P K/S
83-32-9	Acenaphthene	640	PZ ↓
86-73-7	Fluorene	72	U
129-00-0	Pyrene	810	PZ K/S
85-01-8	Phenanthrene	360	J,C
120-12-7	Anthracene	72	U
206-44-0	Fluoranthene	1500	E J,C
218-01-9	Chrysene	400	Z K/S
205-99-2	Benzo(b)fluoranthene	570	EP ↓
207-08-9	Benzo(k)fluoranthene	340	EP ↓
53-70-3	Dibenzo(a,h)anthracene	14	U
191-24-2	Benzo(g,h,i)perylene	14	U
56-55-3	Benzo(a)anthracene	390	Z K/S
50-32-8	Benzo(a)pyrene	120	Z ↓
193-39-5	Indeno(1,2,3-cd)pyrene	130	PZ ↓
208-96-8	Acenaphthylene	220	JPZ J,C

Z (Results reported with a five fold dilution)

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 31 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	61	U
83-32-9	Acenaphthene	250	P J,g
86-73-7	Fluorene	61	U
129-00-0	Pyrene	120	P J,g
85-01-8	Phenanthrene	100	
120-12-7	Anthracene	61	U
206-44-0	Fluoranthene	340	P J,g
218-01-9	Chrysene	89	P
205-99-2	Benzo(b)fluoranthene	130	
207-08-9	Benzo(k)fluoranthene	120	P J,g
53-70-3	Dibenzo(a,h)anthracene	110	P
191-24-2	Benzo(g,h,i)perylene	37	P
56-55-3	Benzo(a)anthracene	67	P
50-32-8	Benzo(a)pyrene	38	P
193-39-5	Indeno(1,2,3-cd)pyrene	72	P
208-96-8	Acenaphthylene	80	P

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11A KH 3/14/03

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 12 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/14/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	48	U
83-32-9	Acenaphthene	48	U
86-73-7	Fluorene	48	U
129-00-0	Pyrene	19	U
85-01-8	Phenanthrene	48	U
120-12-7	Anthracene	48	U
206-44-0	Fluoranthene	44	
218-01-9	Chrysene	9.4	U
205-99-2	Benzo(b)fluoranthene	9.4	U
207-08-9	Benzo(k)fluoranthene	9.4	U
53-70-3	Dibenzo(a,h)anthracene	9.4	U
191-24-2	Benzo(g,h,i)perylene	9.4	U
56-55-3	Benzo(a)anthracene	9.4	U
50-32-8	Benzo(a)pyrene	9.4	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.4	U
208-96-8	Acenaphthylene	48	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 8 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	46	U
83-32-9	Acenaphthene	46	U
86-73-7	Fluorene	46	U
129-00-0	Pyrene	18	U
85-01-8	Phenanthrene	46	U
120-12-7	Anthracene	46	U
206-44-0	Fluoranthene	31	
218-01-9	Chrysene	9.0	JP
205-99-2	Benzo(b)fluoranthene	9.0	U
207-08-9	Benzo(k)fluoranthene	9.0	U
53-70-3	Dibenzo(a,h)anthracene	9.0	U
191-24-2	Benzo(g,h,i)perylene	9.0	U
56-55-3	Benzo(a)anthracene	9.0	U
50-32-8	Benzo(a)pyrene	9.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.0	U
208-96-8	Acenaphthylene	46	U

J/C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/14/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	43	J
86-73-7	Fluorene	49	U
129-00-0	Pyrene	19	JP J,g
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	59	
218-01-9	Chrysene	9.6	U
205-99-2	Benzo(b)fluoranthene	9.6	U
207-08-9	Benzo(k)fluoranthene	9.6	U
53-70-3	Dibenzo(a,h)anthracene	9.6	U
191-24-2	Benzo(g,h,i)perylene	9.6	U
56-55-3	Benzo(a)anthracene	7.4	JP J,g
50-32-8	Benzo(a)pyrene	9.6	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.6	U
208-96-8	Acenaphthylene	49	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-1

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 12 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	81	JZ
83-32-9	Acenaphthene	200	Z
86-73-7	Fluorene	48	U
129-00-0	Pyrene	24	JZ
85-01-8	Phenanthrene	48	U
120-12-7	Anthracene	48	U
206-44-0	Fluoranthene	410	PZ J,C
218-01-9	Chrysene	9.4	U
205-99-2	Benzo(b)fluoranthene	20	P J,g
207-08-9	Benzo(k)fluoranthene	15	
53-70-3	Dibenzo(a,h)anthracene	9.4	U
191-24-2	Benzo(g,h,i)perylene	9.4	U
56-55-3	Benzo(a)anthracene	44	PZ J,g
50-32-8	Benzo(a)pyrene	10	JPZ↓
193-39-5	Indeno(1,2,3-cd)pyrene	9.4	U
208-96-8	Acenaphthylene	48	U

Z (Results reported with a two fold dilution)

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.1	U
319-84-6	alpha-BHC	1.1	U
319-85-7	beta-BHC	1.4	JP JJ
319-86-8	delta-BHC	1.1	U
58-89-9	gamma-BHC (Lindane)	1.1	U
72-54-8	4,4'-DDD	4.2	U
72-55-9	4,4'-DDE	2.2	U
50-29-3	4,4'-DDT	6.3	U
60-57-1	Dieldrin	2.2	U
959-98-8	Endosulfan I	2.2	U
33213-65-9	Endosulfan II	4.2	U
1031-07-8	Endosulfan sulfate	4.2	U
72-20-8	Endrin	4.2	U
7421-93-4	Endrin Aldehyde	4.2	U
76-44-8	Heptachlor	1.1	U
1024-57-3	Heptachlor Epoxide	1.1	U
72-43-5	Methoxychlor	11	U
8001-35-2	Toxaphene	110	U
12674-11-2	Aroclor-1016	82	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	82	U
53469-21-9	Aroclor-1242	57	U
12672-29-6	Aroclor-1248	57	U
11097-69-1	Aroclor-1254	57	U
11096-82-5	Aroclor-1260	82	U
53494-70-5	Endrin Ketone	11	U
5103-74-2	gamma-Chlordane	1.1	U
5103-71-9	alpha-Chlordane	2.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 27 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.1	U
319-84-6	alpha-BHC	0.95	JP J/9
319-85-7	beta-BHC	4.2	P J/9
319-86-8	delta-BHC	1.4	
58-89-9	gamma-BHC (Lindane)	0.55	J
72-54-8	4,4'-DDD	4.5	U
72-55-9	4,4'-DDE	2.3	U
50-29-3	4,4'-DDT	6.8	U
60-57-1	Dieldrin	2.3	U
959-98-8	Endosulfan I	2.3	U
33213-65-9	Endosulfan II	4.5	U
1031-07-8	Endosulfan sulfate	4.5	U
72-20-8	Endrin	4.5	U
7421-93-4	Endrin Aldehyde	4.5	U
76-44-8	Heptachlor	1.1	U
1024-57-3	Heptachlor Epoxide	1.1	U
72-43-5	Methoxychlor	11	U
8001-35-2	Toxaphene	110	U
12674-11-2	Aroclor-1016	89	U
11104-28-2	Aroclor-1221	120	U
11141-16-5	Aroclor-1232	89	U
53469-21-9	Aroclor-1242	62	U
12672-29-6	Aroclor-1248	62	U
11097-69-1	Aroclor-1254	62	U
11096-82-5	Aroclor-1260	89	U
53494-70-5	Endrin Ketone	11	U
5103-74-2	gamma-Chlordane	1.1	U
5103-71-9	alpha-Chlordane	2.3	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.98	U
319-84-6	alpha-BHC	0.98	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	0.98	U
58-89-9	gamma-BHC (Lindane)	0.98	U
72-54-8	4,4'-DDD	3.9	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	5.9	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
72-20-8	Endrin	3.9	U
7421-93-4	Endrin Aldehyde	3.9	U
76-44-8	Heptachlor	0.98	U
1024-57-3	Heptachlor Epoxide	0.98	U
72-43-5	Methoxychlor	9.8	U
8001-35-2	Toxaphene	98	U
12674-11-2	Aroclor-1016	76	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	76	U
53469-21-9	Aroclor-1242	53	U
12672-29-6	Aroclor-1248	53	U
11097-69-1	Aroclor-1254	75	
11096-82-5	Aroclor-1260	76	U
53494-70-5	Endrin Ketone	9.8	U
5103-74-2	gamma-Chlordane	0.98	U
5103-71-9	alpha-Chlordane	2.0	U

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

40SB12A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.98	U
319-84-6	alpha-BHC	0.98	U
319-85-7	beta-BHC	12	P JP
319-86-8	delta-BHC	0.98	U
58-89-9	gamma-BHC (Lindane)	0.55	JP JP
72-54-8	4,4'-DDD	3.9	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	5.9	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
72-20-8	Endrin	3.9	U
7421-93-4	Endrin Aldehyde	3.9	U
76-44-8	Heptachlor	0.98	U
1024-57-3	Heptachlor Epoxide	0.98	U
72-43-5	Methoxychlor	9.8	U
8001-35-2	Toxaphene	98	U
12674-11-2	Aroclor-1016	76	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	76	U
53469-21-9	Aroclor-1242	53	U
12672-29-6	Aroclor-1248	53	U
11097-69-1	Aroclor-1254	220	
11096-82-5	Aroclor-1260	76	U
53494-70-5	Endrin Ketone	9.8	U
5103-74-2	gamma-Chlordane	0.98	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	7.4	P J,a
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.1	U
72-55-9	4,4'-DDE	2.1	U
50-29-3	4,4'-DDT	6.2	U
60-57-1	Dieldrin	2.1	U
959-98-8	Endosulfan I	2.1	U
33213-65-9	Endosulfan II	4.1	U
1031-07-8	Endosulfan sulfate	4.1	U
72-20-8	Endrin	4.1	U
7421-93-4	Endrin Aldehyde	4.1	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	1.0	U
72-43-5	Methoxychlor	10	U
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	80	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	80	U
53469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	39	J
11096-82-5	Aroclor-1260	80	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.1	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	6.6	P J,g
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.1	U
50-29-3	4,4'-DDT	6.1	U
60-57-1	Dieldrin	2.1	U
959-98-8	Endosulfan I	2.1	U
33213-65-9	Endosulfan II	4.0	U
1031-07-8	Endosulfan sulfate	4.0	U
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	1.0	U
72-43-5	Methoxychlor	10	U
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	79	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	79	U
53469-21-9	Aroclor-1242	55	U
12672-29-6	Aroclor-1248	55	U
11097-69-1	Aroclor-1254	29	J
11096-82-5	Aroclor-1260	79	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.1	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	5.3	U
319-84-6	alpha-BHC	5.3	U
319-85-7	beta-BHC	11	U
319-86-8	delta-BHC	5.3	U
58-89-9	gamma-BHC (Lindane)	5.3	U
72-54-8	4,4'-DDD	21	U
72-55-9	4,4'-DDE	11	U
50-29-3	4,4'-DDT	32	U
60-57-1	Dieldrin	11	U
959-98-8	Endosulfan I	11	U
33213-65-9	Endosulfan II	21	U
1031-07-8	Endosulfan sulfate	21	U
72-20-8	Endrin	21	U
7421-93-4	Endrin Aldehyde	21	U
76-44-8	Heptachlor	5.3	U
1024-57-3	Heptachlor Epoxide	5.3	U
72-43-5	Methoxychlor	53	U
8001-35-2	Toxaphene	530	U
12674-11-2	Aroclor-1016	410	U
11104-28-2	Aroclor-1221	540	U
11141-16-5	Aroclor-1232	410	U
53469-21-9	Aroclor-1242	280	U
12672-29-6	Aroclor-1248	280	U
11097-69-1	Aroclor-1254	2100	
11096-82-5	Aroclor-1260	410	U
53494-70-5	Endrin Ketone	53	U
5103-74-2	gamma-Chlordane	5.3	U
5103-71-9	alpha-Chlordane	11	U

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

40SS2

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

Do not use per

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
309-00-2	Aldrin	1.0	U	UL,S
319-84-6	alpha-BHC	1.0	U	
319-85-7	beta-BHC	2.1	U	
319-86-8	delta-BHC	1.0	U	
58-89-9	gamma-BHC (Lindane)	1.0	U	
72-54-8	4,4'-DDD	4.1	U	
72-55-9	4,4'-DDE	2.1	U	
50-29-3	4,4'-DDT	6.2	U	
60-57-1	Dieldrin	2.1	U	
959-98-8	Endosulfan I	2.1	U	
33213-65-9	Endosulfan II	4.1	U	
1031-07-8	Endosulfan sulfate	4.1	U	
72-20-8	Endrin	4.1	U	
7421-93-4	Endrin Aldehyde	4.1	U	
76-44-8	Heptachlor	1.0	U	
1024-57-3	Heptachlor Epoxide	1.0	U	
72-43-5	Methoxychlor	10	U	
8001-35-2	Toxaphene	100	U	
12674-11-2	Aroclor-1016	80	U	
11104-28-2	Aroclor-1221	100	U	
11141-16-5	Aroclor-1232	80	U	
53469-21-9	Aroclor-1242	56	U	
12672-29-6	Aroclor-1248	56	U	
11097-69-1	Aroclor-1254	35	J	L,S
11096-82-5	Aroclor-1260	80	U	UL,S
53494-70-5	Endrin Ketone	10	U	
5103-74-2	gamma-Chlordane	1.0	U	
5103-71-9	alpha-Chlordane	2.1	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS2RE

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/13/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/15/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.1	P
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.1	U
72-55-9	4,4'-DDE	2.1	U
50-29-3	4,4'-DDT	6.2	U
60-57-1	Dieldrin	2.1	U
959-98-8	Endosulfan I	2.1	U
33213-65-9	Endosulfan II	4.1	U
1031-07-8	Endosulfan sulfate	4.1	U
72-20-8	Endrin	4.1	U
7421-93-4	Endrin Aldehyde	4.1	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	1.0	U
72-43-5	Methoxychlor	10	U
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	80	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	80	U
53469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	120	
11096-82-5	Aroclor-1260	80	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.1	U

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

40SS3

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.1	U
319-84-6	alpha-BHC	1.1	U
319-85-7	beta-BHC	5.7	
319-86-8	delta-BHC	1.1	U
58-89-9	gamma-BHC (Lindane)	1.1	U
72-54-8	4,4'-DDD	4.2	U
72-55-9	4,4'-DDE	2.2	U
50-29-3	4,4'-DDT	6.3	U
60-57-1	Dieldrin	2.2	U
959-98-8	Endosulfan I	2.2	U
33213-65-9	Endosulfan II	4.2	U
1031-07-8	Endosulfan sulfate	4.2	U
72-20-8	Endrin	4.2	U
7421-93-4	Endrin Aldehyde	4.2	U
76-44-8	Heptachlor	1.1	U
1024-57-3	Heptachlor Epoxide	1.1	U
72-43-5	Methoxychlor	11	U
8001-35-2	Toxaphene	110	U
12674-11-2	Aroclor-1016	82	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	82	U
53469-21-9	Aroclor-1242	57	U
12672-29-6	Aroclor-1248	57	U
11097-69-1	Aroclor-1254	270	
11096-82-5	Aroclor-1260	82	U
53494-70-5	Endrin Ketone	11	U
5103-74-2	gamma-Chlordane	1.1	U
5103-71-9	alpha-Chlordane	2.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 42 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	5.1	P J/8
319-84-6	alpha-BHC	1.4	U
319-85-7	beta-BHC	2.9	U
319-86-8	delta-BHC	1.4	U
58-89-9	gamma-BHC (Lindane)	11	P J/8
72-54-8	4,4'-DDD	5.7	U
72-55-9	4,4'-DDE	2.9	U
50-29-3	4,4'-DDT	7.7	JP J/8
60-57-1	Dieldrin	2.9	U
959-98-8	Endosulfan I	2.9	U
33213-65-9	Endosulfan II	5.7	U
1031-07-8	Endosulfan sulfate	29	P J/8
72-20-8	Endrin	3.9	J
7421-93-4	Endrin Aldehyde	5.7	U
76-44-8	Heptachlor	1.4	U
1024-57-3	Heptachlor Epoxide	1.4	U
72-43-5	Methoxychlor	43	
8001-35-2	Toxaphene	140	U
12674-11-2	Aroclor-1016	110	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	110	U
53469-21-9	Aroclor-1242	78	U
12672-29-6	Aroclor-1248	78	U
11097-69-1	Aroclor-1254	78	U
11096-82-5	Aroclor-1260	110	U
53494-70-5	Endrin Ketone	24	P J/8
5103-74-2	gamma-Chlordane	7.6	
5103-71-9	alpha-Chlordane	2.9	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 31 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	2.1	P J/8
319-84-6	alpha-BHC	1.2	U
319-85-7	beta-BHC	2.5	U
319-86-8	delta-BHC	1.2	U
58-89-9	gamma-BHC (Lindane)	1.2	U
72-54-8	4,4'-DDD	4.8	U
72-55-9	4,4'-DDE	2.5	U
50-29-3	4,4'-DDT	7.2	U
60-57-1	Dieldrin	2.5	U
959-98-8	Endosulfan I	2.5	U
33213-65-9	Endosulfan II	4.8	U
1031-07-8	Endosulfan sulfate	4.8	U
72-20-8	Endrin	4.8	U
7421-93-4	Endrin Aldehyde	4.8	U
76-44-8	Heptachlor	1.2	U
1024-57-3	Heptachlor Epoxide	1.2	U
72-43-5	Methoxychlor	12	U
8001-35-2	Toxaphene	120	U
12674-11-2	Aroclor-1016	94	U
11104-28-2	Aroclor-1221	120	U
11141-16-5	Aroclor-1232	94	U
53469-21-9	Aroclor-1242	65	U
12672-29-6	Aroclor-1248	65	U
11097-69-1	Aroclor-1254	48	J
11096-82-5	Aroclor-1260	94	U
53494-70-5	Endrin Ketone	12	U
5103-74-2	gamma-Chlordane	1.2	U
5103-71-9	alpha-Chlordane	2.5	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11A
KH 3/14/03

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 12 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.86	JP J,g
319-84-6	alpha-BHC	0.94	U
319-85-7	beta-BHC	5.5	P J,g
319-86-8	delta-BHC	0.94	U
58-89-9	gamma-BHC (Lindane)	0.99	P J,g
72-54-8	4,4'-DDD	3.8	U
72-55-9	4,4'-DDE	1.9	U
50-29-3	4,4'-DDT	5.7	U
60-57-1	Dieldrin	1.9	U
959-98-8	Endosulfan I	1.9	U
33213-65-9	Endosulfan II	3.8	U
1031-07-8	Endosulfan sulfate	3.8	U
72-20-8	Endrin	3.8	U
7421-93-4	Endrin Aldehyde	3.8	U
76-44-8	Heptachlor	0.94	U
1024-57-3	Heptachlor Epoxide	0.94	U
72-43-5	Methoxychlor	9.4	U
8001-35-2	Toxaphene	94	U
12674-11-2	Aroclor-1016	74	U
11104-28-2	Aroclor-1221	97	U
11141-16-5	Aroclor-1232	74	U
53469-21-9	Aroclor-1242	51	U
12672-29-6	Aroclor-1248	51	U
11097-69-1	Aroclor-1254	34	JP J,g
11096-82-5	Aroclor-1260	74	U
53494-70-5	Endrin Ketone	9.4	U
5103-74-2	gamma-Chlordane	0.94	U
5103-71-9	alpha-Chlordane	1.9	U

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

71SS11

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 8 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.90	U
319-84-6	alpha-BHC	0.90	U
319-85-7	beta-BHC	3.4	P JA
319-86-8	delta-BHC	0.90	U
58-89-9	gamma-BHC (Lindane)	0.90	U
72-54-8	4,4'-DDD	3.6	U
72-55-9	4,4'-DDE	1.8	U
50-29-3	4,4'-DDT	5.4	U
60-57-1	Dieldrin	1.8	U
959-98-8	Endosulfan I	1.8	U
33213-65-9	Endosulfan II	3.6	U
1031-07-8	Endosulfan sulfate	3.6	U
72-20-8	Endrin	3.6	U
7421-93-4	Endrin Aldehyde	3.6	U
76-44-8	Heptachlor	0.90	U
1024-57-3	Heptachlor Epoxide	0.90	U
72-43-5	Methoxychlor	9.0	U
8001-35-2	Toxaphene	90	U
12674-11-2	Aroclor-1016	71	U
11104-28-2	Aroclor-1221	92	U
11141-16-5	Aroclor-1232	71	U
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	49	U
11097-69-1	Aroclor-1254	24	J
11096-82-5	Aroclor-1260	71	U
53494-70-5	Endrin Ketone	9.0	U
5103-74-2	gamma-Chlordane	0.90	U
5103-71-9	alpha-Chlordane	1.8	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	P J/9
319-84-6	alpha-BHC	0.97	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	0.97	U
58-89-9	gamma-BHC (Lindane)	0.97	U
72-54-8	4,4'-DDD	3.8	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	5.8	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.8	U
1031-07-8	Endosulfan sulfate	3.8	U
72-20-8	Endrin	3.8	U
7421-93-4	Endrin Aldehyde	3.8	U
76-44-8	Heptachlor	0.97	U
1024-57-3	Heptachlor Epoxide	0.97	U
72-43-5	Methoxychlor	9.7	U
8001-35-2	Toxaphene	97	U
12674-11-2	Aroclor-1016	76	U
11104-28-2	Aroclor-1221	99	U
11141-16-5	Aroclor-1232	76	U
53469-21-9	Aroclor-1242	52	U
12672-29-6	Aroclor-1248	52	U
11097-69-1	Aroclor-1254	120	
11096-82-5	Aroclor-1260	76	U
53494-70-5	Endrin Ketone	9.7	U
5103-74-2	gamma-Chlordane	0.97	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-1

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 12 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.1	P J,9
319-84-6	alpha-BHC	0.94	U
319-85-7	beta-BHC	1.9	U
319-86-8	delta-BHC	0.94	U
58-89-9	gamma-BHC (Lindane)	0.94	U
72-54-8	4,4'-DDD	3.8	U
72-55-9	4,4'-DDE	1.9	U
50-29-3	4,4'-DDT	5.7	U
60-57-1	Dieldrin	1.9	U
959-98-8	Endosulfan I	1.9	U
33213-65-9	Endosulfan II	3.8	U
1031-07-8	Endosulfan sulfate	3.8	U
72-20-8	Endrin	3.8	U
7421-93-4	Endrin Aldehyde	3.8	U
76-44-8	Heptachlor	0.94	U
1024-57-3	Heptachlor Epoxide	0.94	U
72-43-5	Methoxychlor	9.4	U
8001-35-2	Toxaphene	94	U
12674-11-2	Aroclor-1016	74	U
11104-28-2	Aroclor-1221	97	U
11141-16-5	Aroclor-1232	74	U
53469-21-9	Aroclor-1242	51	U
12672-29-6	Aroclor-1248	51	U
11097-69-1	Aroclor-1254	94	
11096-82-5	Aroclor-1260	74	U
53494-70-5	Endrin Ketone	9.4	U
5103-74-2	gamma-Chlordane	0.94	U
5103-71-9	alpha-Chlordane	1.9	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U UJ,C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	UUJ,C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U UJ, C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U UJ,C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U UJ,PP
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9CMS

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21435-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	2.2	
99-35-4	1,3,5-Trinitrobenzene	2.0	
121-82-4	RDX	2.5	
99-65-0	1,3-Dinitrobenzene	2.2	
118-96-7	2,4,6-Trinitrotoluene	1.6	
479-45-8	Tetryl	1.7	J
98-95-3	Nitrobenzene	0.86	J
121-14-2	2,4-Dinitrotoluene	1.9	
606-20-2	2,6-Dinitrotoluene	3.1	
35572-78-2	2-Amino-4,6-dinitrotoluene	2.6	
1946-51-0	4-Amino-2,6-dinitrotoluene	4.5	
88-72-2	2-Nitrotoluene	2.5	
99-99-0	4-Nitrotoluene	2.6	
99-08-1	3-Nitrotoluene	2.6	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9CMSD

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21435-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	2.8	
99-35-4	1,3,5-Trinitrobenzene	1.5	
121-82-4	RDX	1.6	
99-65-0	1,3-Dinitrobenzene	2.0	
118-96-7	2,4,6-Trinitrotoluene	1.6	
479-45-8	Tetryl	1.6	J
98-95-3	Nitrobenzene	0.78	J
121-14-2	2,4-Dinitrotoluene	2.0	
606-20-2	2,6-Dinitrotoluene	2.6	
35572-78-2	2-Amino-4,6-dinitrotoluene	2.4	
1946-51-0	4-Amino-2,6-dinitrotoluene	4.4	
88-72-2	2-Nitrotoluene	2.7	
99-99-0	4-Nitrotoluene	2.8	
99-08-1	3-Nitrotoluene	2.3	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted: 11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11A
KH 3/14/03

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-1

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11A
KH 3/14/03

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-1

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9CMS

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21435-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	7.0	J

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9CMSD

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21435-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	7.4	J

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PLCSTS

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21341-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/14/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	9.4	J

FORM I PEST

32A

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PLCSUZ

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21435-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	8.6	J

FORM I PEST

32B

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-14

Level (low/med): LOW Date Received: 11/13/02

% Solids: 78.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	29400			P	
7440-36-0	Antimony	0.46	B	N	P	L,M
7440-38-2	Arsenic	5.6		N	P	K,M
7440-39-3	Barium	52.5			P	
7440-41-7	Beryllium	2.1			P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	1390			P	L,P
7440-47-3	Chromium	33.7			P	
7440-48-4	Cobalt	7.0		*	P	
7440-50-8	Copper	26.7		N	P	K,M
7439-89-6	Iron	33400			P	
7439-92-1	Lead	11.9		N	P	K,M
7439-95-4	Magnesium	8560		*	P	
7439-96-5	Manganese	271		N	P	K,M
7439-97-6	Mercury	0.094			CV	
7440-02-0	Nickel	32.4			P	
7440-09-7	Potassium	2180		*E	P	J,S
7782-49-2	Selenium	0.95		N	P	L,M
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	38.3	U		P	
7440-28-0	Thallium	0.30	U	N	P	UL,M
7440-62-2	Vanadium	58.3			P	
7440-66-6	Zinc	38.1			P	L,P

Color Before: BROWN-RED Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-15

Level (low/med): LOW Date Received: 11/13/02

% Solids: 72.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	35100			P	
7440-36-0	Antimony	0.53	B	N	P	LIM
7440-38-2	Arsenic	6.5		N	P	KIM
7440-39-3	Barium	50.0			P	
7440-41-7	Beryllium	1.7			P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	2240			P	LIP
7440-47-3	Chromium	32.6			P	
7440-48-4	Cobalt	6.0		*	P	
7440-50-8	Copper	27.7		N	P	KIM
7439-89-6	Iron	29500			P	
7439-92-1	Lead	9.1		N	P	KIM
7439-95-4	Magnesium	27400		*	P	
7439-96-5	Manganese	262		N	P	KIM
7439-97-6	Mercury	0.037	B		CV	
7440-02-0	Nickel	26.2			P	
7440-09-7	Potassium	5100		*E	P	JS
7782-49-2	Selenium	0.62	B	N	P	LIM
7440-22-4	Silver	0.11	U		P	
7440-23-5	Sodium	40.3	U		P	
7440-28-0	Thallium	0.32	U	N	P	ULIM
7440-62-2	Vanadium	55.4			P	
7440-66-6	Zinc	52.1			P	LIP

Color Before: MUSTARD Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB11F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-13

Level (low/med): LOW Date Received: 11/13/02

% Solids: 84.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11900			P	
7440-36-0	Antimony	0.39	B	N	P	L,M
7440-38-2	Arsenic	3.4		N	P	K,M
7440-39-3	Barium	40.9			P	
7440-41-7	Beryllium	0.24	B		P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	26100			P	L,P
7440-47-3	Chromium	16.2			P	
7440-48-4	Cobalt	5.0		*	P	
7440-50-8	Copper	10.0		N	P	K,M
7439-89-6	Iron	18100			P	
7439-92-1	Lead	13.2		N	P	K,M
7439-95-4	Magnesium	14400		*	P	
7439-96-5	Manganese	282		N	P	K,M
7439-97-6	Mercury	0.18			CV	
7440-02-0	Nickel	3.6			P	
7440-09-7	Potassium	382		*E	P	J,S
7782-49-2	Selenium	0.82		N	P	L,M
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	223			P	B,X
7440-28-0	Thallium	0.26	U	N	P	UL,M
7440-62-2	Vanadium	36.0			P	
7440-66-6	Zinc	15.8			P	L,P

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

16

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-1

Level (low/med): LOW Date Received: 11/12/02

% Solids: 84.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	16000			P	
7440-36-0	Antimony	0.49	B	N	P	L,M
7440-38-2	Arsenic	5.3		N	P	K,M
7440-39-3	Barium	67.8			P	
7440-41-7	Beryllium	0.74			P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	7960			P	L,P
7440-47-3	Chromium	21.4			P	
7440-48-4	Cobalt	8.2		*	P	
7440-50-8	Copper	21.9		N	P	K,M
7439-89-6	Iron	21200			P	
7439-92-1	Lead	26.2		N	P	K,M
7439-95-4	Magnesium	8290		*	P	
7439-96-5	Manganese	344		N	P	K,M
7439-97-6	Mercury	0.15			CV	
7440-02-0	Nickel	12.2			P	
7440-09-7	Potassium	1410		*E	P	J,S
7782-49-2	Selenium	0.85		N	P	L,M
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	86.8	B		P	B,X
7440-28-0	Thallium	0.27	U	N	P	UL,M
7440-62-2	Vanadium	39.9			P	
7440-66-6	Zinc	71.1			P	L,P

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-2

Level (low/med): LOW Date Received: 11/12/02

% Solids: 74.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	20000			P	
7440-36-0	Antimony	1.2	B	N	P	L,M
7440-38-2	Arsenic	9.7		N	P	K,M
7440-39-3	Barium	46.0			P	
7440-41-7	Beryllium	1.3			P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	657			P	L,P
7440-47-3	Chromium	86.3			P	
7440-48-4	Cobalt	14.0		*	P	
7440-50-8	Copper	19.6		N	P	K,M
7439-89-6	Iron	49300			P	
7439-92-1	Lead	17.3		N	P	K,M
7439-95-4	Magnesium	7090		*	P	
7439-96-5	Manganese	699		N	P	K,M
7439-97-6	Mercury	0.040			CV	
7440-02-0	Nickel	16.6			P	
7440-09-7	Potassium	1340		*E	P	J,S
7782-49-2	Selenium	2.5		N	P	K,M
7440-22-4	Silver	0.11	U		P	
7440-23-5	Sodium	188	B		P	B,X
7440-28-0	Thallium	0.82	B	N	P	K,W
7440-62-2	Vanadium	95.2			P	
7440-66-6	Zinc	36.6			P	L,P

Color Before: GRAY- RED Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-3

Level (low/med): LOW Date Received: 11/12/02

% Solids: 61.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	26000			P	
7440-36-0	Antimony	0.55	B	N	P	L,M
7440-38-2	Arsenic	7.1		N	P	K,M
7440-39-3	Barium	36.3			P	
7440-41-7	Beryllium	1.3			P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1730			P	L,P
7440-47-3	Chromium	39.1			P	
7440-48-4	Cobalt	6.0		*	P	
7440-50-8	Copper	24.1		N	P	K,M
7439-89-6	Iron	29900			P	
7439-92-1	Lead	53.6		N	P	K,M
7439-95-4	Magnesium	51800		*	P	
7439-96-5	Manganese	474		N	P	K,M
7439-97-6	Mercury	0.026	U		CV	
7440-02-0	Nickel	26.7			P	
7440-09-7	Potassium	8040		*E	P	J,S
7782-49-2	Selenium	0.91		N	P	L,M
7440-22-4	Silver	0.12	U		P	
7440-23-5	Sodium	4760			P	
7440-28-0	Thallium	0.37	U	N	P	UL,M
7440-62-2	Vanadium	60.8			P	
7440-66-6	Zinc	54.4			P	L,P

Color Before: MUSTARD Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-19

Level (low/med): LOW Date Received: 11/14/02

% Solids: 81.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17900			P	
7440-36-0	Antimony	0.52	B	N	P	L,M
7440-38-2	Arsenic	3.0		N	P	K,M
7440-39-3	Barium	73.5			P	
7440-41-7	Beryllium	0.50	B		P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	1250			P	L,P
7440-47-3	Chromium	22.4			P	
7440-48-4	Cobalt	7.4		*	P	
7440-50-8	Copper	11.5		N	P	K,M
7439-89-6	Iron	26800			P	
7439-92-1	Lead	15.5		N	P	K,M
7439-95-4	Magnesium	1230		*	P	
7439-96-5	Manganese	611		N	P	K,M
7439-97-6	Mercury	0.075			CV	
7440-02-0	Nickel	6.5			P	
7440-09-7	Potassium	833		*E	P	J,S
7782-49-2	Selenium	1.5		N	P	L,M
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	88.7	B		P	B,x
7440-28-0	Thallium	0.27	U	N	P	UL,M
7440-62-2	Vanadium	53.1			P	
7440-66-6	Zinc	34.4			P	L,P

Color Before: RED Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-20

Level (low/med): LOW Date Received: 11/14/02

% Solids: 79.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11700			P	
7440-36-0	Antimony	1.8		N	P	L,M
7440-38-2	Arsenic	15.2		N	P	K,M
7440-39-3	Barium	116			P	
7440-41-7	Beryllium	0.82			P	
7440-43-9	Cadmium	2.0			P	
7440-70-2	Calcium	10600			P	L,P
7440-47-3	Chromium	234			P	
7440-48-4	Cobalt	11.9		*	P	
7440-50-8	Copper	108		N	P	K,M
7439-89-6	Iron	37900			P	
7439-92-1	Lead	58.5		N	P	K,M
7439-95-4	Magnesium	4440		*	P	
7439-96-5	Manganese	392		N	P	K,M
7439-97-6	Mercury	0.23			CV	
7440-02-0	Nickel	77.7			P	
7440-09-7	Potassium	802		*E	P	W,S
7782-49-2	Selenium	3.6		N	P	L,M
7440-22-4	Silver	0.12	B		P	K,W
7440-23-5	Sodium	345			P	B,X
7440-28-0	Thallium	0.29	U	N	P	UL,M
7440-62-2	Vanadium	34.8			P	
7440-66-6	Zinc	67.4			P	L,P

Color Before: GRAY Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-16

Level (low/med): LOW Date Received: 11/14/02

% Solids: 82.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	19200			P	
7440-36-0	Antimony	0.49	B	N	P	L,M
7440-38-2	Arsenic	4.1		N	P	K,M
7440-39-3	Barium	51.7			P	
7440-41-7	Beryllium	0.44	B		P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	2130			P	L,P
7440-47-3	Chromium	22.7			P	
7440-48-4	Cobalt	6.6		*	P	
7440-50-8	Copper	11.6		N	P	K,M
7439-89-6	Iron	26600			P	
7439-92-1	Lead	16.6		N	P	K,M
7439-95-4	Magnesium	1940		*	P	
7439-96-5	Manganese	262		N	P	K,M
7439-97-6	Mercury	0.068			CV	
7440-02-0	Nickel	7.0			P	
7440-09-7	Potassium	720		*E	P	J,S
7782-49-2	Selenium	1.2		N	P	L,M
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	93.5	B		P	B,C
7440-28-0	Thallium	0.29	U	N	P	UL,M
7440-62-2	Vanadium	56.9			P	
7440-66-6	Zinc	31.7			P	L,P

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-18

Level (low/med): LOW Date Received: 11/14/02

% Solids: 76.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	26200			P	
7440-36-0	Antimony	0.64	B	N	P	L,M
7440-38-2	Arsenic	5.7		N	P	K,M
7440-39-3	Barium	51.8			P	
7440-41-7	Beryllium	1.4			P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	426			P	L,P
7440-47-3	Chromium	39.5			P	
7440-48-4	Cobalt	13.5		*	P	
7440-50-8	Copper	25.4		N	P	K,M
7439-89-6	Iron	32100			P	
7439-92-1	Lead	10.0		N	P	K,M
7439-95-4	Magnesium	13700		*	P	
7439-96-5	Manganese	236		N	P	K,M
7439-97-6	Mercury	0.058			CV	
7440-02-0	Nickel	21.3			P	
7440-09-7	Potassium	3670		*E	P	J,S
7782-49-2	Selenium	1.2		N	P	L,M
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	4460			P	
7440-28-0	Thallium	0.31	U	N	P	UL,M
7440-62-2	Vanadium	62.6			P	
7440-66-6	Zinc	36.6			P	L,P

Color Before: BROWN GRAY Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-17

Level (low/med): LOW Date Received: 11/14/02

% Solids: 80.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14800			P	
7440-36-0	Antimony	0.54	B	N	P	L,M
7440-38-2	Arsenic	4.2		N	P	K,M
7440-39-3	Barium	60.0			P	
7440-41-7	Beryllium	0.52	B		P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	64000			P	L,P
7440-47-3	Chromium	17.5			P	
7440-48-4	Cobalt	7.0		*	P	
7440-50-8	Copper	20.4		N	P	K,M
7439-89-6	Iron	17600			P	
7439-92-1	Lead	18.5		N	P	K,M
7439-95-4	Magnesium	36800		*	P	
7439-96-5	Manganese	272		N	P	K,M
7439-97-6	Mercury	0.026	B		CV	
7440-02-0	Nickel	10.5			P	
7440-09-7	Potassium	1740		*E	P	J,S
7782-49-2	Selenium	0.45	B	N	P	L,M
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	4110			P	
7440-28-0	Thallium	0.28	U	N	P	UL,M
7440-62-2	Vanadium	31.2			P	
7440-66-6	Zinc	49.2			P	L,P

Color Before: GRAY Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-12

Level (low/med): LOW Date Received: 11/12/02

% Solids: 78.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14200			P	
7440-36-0	Antimony	0.51	B	N	P	L,M
7440-38-2	Arsenic	6.5		N	P	K,M
7440-39-3	Barium	96.8			P	
7440-41-7	Beryllium	0.66			P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	12900			P	L,P
7440-47-3	Chromium	26.9			P	
7440-48-4	Cobalt	11.3		*	P	
7440-50-8	Copper	30.8		N	P	K,M
7439-89-6	Iron	22500			P	
7439-92-1	Lead	37.9		N	P	K,M
7439-95-4	Magnesium	8310		*	P	
7439-96-5	Manganese	894		N	P	K,M
7439-97-6	Mercury	0.27			CV	
7440-02-0	Nickel	8.6			P	
7440-09-7	Potassium	1010		*E	P	J,S
7782-49-2	Selenium	1.3		N	P	L,M
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	188	B		P	B,X
7440-28-0	Thallium	0.30	U	N	P	UL,M
7440-62-2	Vanadium	43.5			P	
7440-66-6	Zinc	72.4			P	L,P

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-11

Level (low/med): LOW Date Received: 11/12/02

% Solids: 81.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15300			P	
7440-36-0	Antimony	0.54	B	N	P	L,M
7440-38-2	Arsenic	5.0		N	P	K,M
7440-39-3	Barium	56.5			P	
7440-41-7	Beryllium	0.47	B		P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	2560			P	L,P
7440-47-3	Chromium	21.5			P	
7440-48-4	Cobalt	6.0		*	P	
7440-50-8	Copper	11.5		N	P	K,M
7439-89-6	Iron	24400			P	
7439-92-1	Lead	21.3		N	P	K,M
7439-95-4	Magnesium	1970		*	P	
7439-96-5	Manganese	318		N	P	K,M
7439-97-6	Mercury	0.096			CV	
7440-02-0	Nickel	6.3			P	
7440-09-7	Potassium	1020		*E	P	J,S
7782-49-2	Selenium	1.0		N	P	L,M
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	96.5	B		P	B,X
7440-28-0	Thallium	0.29	U	N	P	UL,M
7440-62-2	Vanadium	49.2			P	
7440-66-6	Zinc	42.9			P	L,P

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-10

Level (low/med): LOW Date Received: 11/12/02

% Solids: 79.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14500			P	
7440-36-0	Antimony	0.57	B	N	P	L,M
7440-38-2	Arsenic	5.0		N	P	K,M
7440-39-3	Barium	57.0			P	
7440-41-7	Beryllium	0.63			P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	5070			P	L,P
7440-47-3	Chromium	37.6			P	
7440-48-4	Cobalt	8.5		*	P	
7440-50-8	Copper	13.9		N	P	K,M
7439-89-6	Iron	27100			P	
7439-92-1	Lead	21.7		N	P	K,M
7439-95-4	Magnesium	3950		*	P	
7439-96-5	Manganese	487		N	P	K,M
7439-97-6	Mercury	0.080			CV	
7440-02-0	Nickel	7.3			P	
7440-09-7	Potassium	1170		*E	P	J,S
7782-49-2	Selenium	1.2		N	P	L,M
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	101	B		P	B,C
7440-28-0	Thallium	0.28	U	N	P	UL,M
7440-62-2	Vanadium	54.5			P	
7440-66-6	Zinc	46.8			P	L,P

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-7

Level (low/med): LOW Date Received: 11/12/02

% Solids: 58.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1780			P	
7440-36-0	Antimony	0.46	B	N	P	L,M
7440-38-2	Arsenic	10.1		N	P	K,M
7440-39-3	Barium	35.3			P	
7440-41-7	Beryllium	0.64	B		P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1040			P	L,P
7440-47-3	Chromium	7.5			P	
7440-48-4	Cobalt	3.3		*	P	
7440-50-8	Copper	32.5		N	P	K,M
7439-89-6	Iron	2520			P	
7439-92-1	Lead	20.6		N	P	K,M
7439-95-4	Magnesium	318		*	P	
7439-96-5	Manganese	29.5		N	P	K,M
7439-97-6	Mercury	0.053	B		CV	
7440-02-0	Nickel	8.6			P	
7440-09-7	Potassium	136	B	*E	P	L,W
7782-49-2	Selenium	0.52	B	N	P	L,M
7440-22-4	Silver	0.13	U		P	
7440-23-5	Sodium	229	B		P	B,X
7440-28-0	Thallium	0.40	U	N	P	UL,M
7440-62-2	Vanadium	7.7			P	
7440-66-6	Zinc	19.6			P	L,P

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-8

Level (low/med): LOW Date Received: 11/12/02

% Solids: 69.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	659			P	
7440-36-0	Antimony	0.17	U	N	P	ULIM
7440-38-2	Arsenic	1.3	B	N	P	KIM
7440-39-3	Barium	14.6			P	
7440-41-7	Beryllium	0.24	B		P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	457			P	LIP
7440-47-3	Chromium	4.1			P	
7440-48-4	Cobalt	1.8		*	P	
7440-50-8	Copper	6.9		N	P	KIM
7439-89-6	Iron	1440			P	
7439-92-1	Lead	3.8		N	P	KIM
7439-95-4	Magnesium	120	B	*	P	
7439-96-5	Manganese	10.7		N	P	KIM
7439-97-6	Mercury	0.023	U		CV	
7440-02-0	Nickel	4.3			P	
7440-09-7	Potassium	89.2	B	*E	P	LIW
7782-49-2	Selenium	0.42	U	N	P	ULIM
7440-22-4	Silver	0.11	U		P	
7440-23-5	Sodium	220	B		P	BIC
7440-28-0	Thallium	0.34	U	N	P	ULIM
7440-62-2	Vanadium	5.4			P	
7440-66-6	Zinc	5.5			P	LIW

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

71SB11A KH 3/17/03

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-4

Level (low/med): LOW Date Received: 11/12/02

% Solids: 87.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6510			P	
7440-36-0	Antimony	0.34	B	N	P	L,M
7440-38-2	Arsenic	4.7		N	P	L,M
7440-39-3	Barium	62.0			P	
7440-41-7	Beryllium	0.32	B		P	
7440-43-9	Cadmium	0.03	B		P	
7440-70-2	Calcium	159000			P	L,P
7440-47-3	Chromium	11.1			P	
7440-48-4	Cobalt	3.4		*	P	
7440-50-8	Copper	16.0		N	P	K,M
7439-89-6	Iron	8710			P	
7439-92-1	Lead	11.5		N	P	K,M
7439-95-4	Magnesium	69800		*	P	
7439-96-5	Manganese	114		N	P	K,M
7439-97-6	Mercury	0.023	B		CV	
7440-02-0	Nickel	7.9			P	
7440-09-7	Potassium	1250		*E	P	J,S
7782-49-2	Selenium	0.31	U	N	P	UL,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	285			P	B,C
7440-28-0	Thallium	0.25	U	N	P	UL,M
7440-62-2	Vanadium	17.2			P	
7440-66-6	Zinc	31.4			P	L,P

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-9

Level (low/med): LOW Date Received: 11/12/02

% Solids: 92.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4480			P	
7440-36-0	Antimony	0.20	B	N	P	L,M
7440-38-2	Arsenic	6.4		N	P	K,M
7440-39-3	Barium	51.3			P	
7440-41-7	Beryllium	0.33	B		P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	165000			P	L,P
7440-47-3	Chromium	11.0			P	
7440-48-4	Cobalt	2.9		*	P	
7440-50-8	Copper	15.8		N	P	K,M
7439-89-6	Iron	6730			P	
7439-92-1	Lead	9.9		N	P	K,M
7439-95-4	Magnesium	74800		*	P	
7439-96-5	Manganese	97.4		N	P	K,M
7439-97-6	Mercury	0.019	B		CV	
7440-02-0	Nickel	7.1			P	
7440-09-7	Potassium	1300		*E	P	J,S
7782-49-2	Selenium	0.32	U	N	P	D,L,M
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	296			P	B,X
7440-28-0	Thallium	0.26	U	N	P	D,L,M
7440-62-2	Vanadium	12.9			P	
7440-66-6	Zinc	24.5			P	L,P

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-5

Level (low/med): LOW Date Received: 11/12/02

% Solids: 86.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4040			P	
7440-36-0	Antimony	0.85	B	N	P	L,M
7440-38-2	Arsenic	11.6		N	P	L,M
7440-39-3	Barium	84.0			P	
7440-41-7	Beryllium	0.31	B		P	
7440-43-9	Cadmium	0.14	B		P	
7440-70-2	Calcium	165000			P	L,P
7440-47-3	Chromium	13.6			P	
7440-48-4	Cobalt	2.9		*	P	
7440-50-8	Copper	31.0		N	P	K,M
7439-89-6	Iron	15600			P	
7439-92-1	Lead	44.1		N	P	K,M
7439-95-4	Magnesium	79800		*	P	
7439-96-5	Manganese	153		N	P	K,M
7439-97-6	Mercury	0.13			CV	
7440-02-0	Nickel	7.5			P	
7440-09-7	Potassium	913		*E	P	J,S
7782-49-2	Selenium	0.61		N	P	L,M
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	312			P	B,K
7440-28-0	Thallium	0.28	U	N	P	UL,M
7440-62-2	Vanadium	14.7			P	
7440-66-6	Zinc	40.3			P	L,P

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Lab Sample ID: Q2788-6

Level (low/med): LOW Date Received: 11/12/02

% Solids: 88.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3840			P	
7440-36-0	Antimony	0.39	B	N	P	L,M
7440-38-2	Arsenic	20.6		N	P	K,M
7440-39-3	Barium	56.1			P	
7440-41-7	Beryllium	0.27	B		P	
7440-43-9	Cadmium	0.48	B		P	
7440-70-2	Calcium	179000			P	L,P
7440-47-3	Chromium	9.6			P	
7440-48-4	Cobalt	2.4		*	P	
7440-50-8	Copper	33.1		N	P	K,M
7439-89-6	Iron	8340			P	
7439-92-1	Lead	35.4		N	P	K,M
7439-95-4	Magnesium	67500		*	P	
7439-96-5	Manganese	115		N	P	K,M
7439-97-6	Mercury	0.13			CV	
7440-02-0	Nickel	5.9			P	
7440-09-7	Potassium	784		*E	P	J/P
7782-49-2	Selenium	0.34	U	N	P	UL,M
7440-22-4	Silver	2.1			P	
7440-23-5	Sodium	339			P	B,K
7440-28-0	Thallium	0.27	U	N	P	UL,M
7440-62-2	Vanadium	13.0			P	
7440-66-6	Zinc	44.2			P	L,P

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

DATA VALIDATION WORKSHEET

Volatile Organic Analysis by GC/MS

Reviewer: RA
Date: 1/31/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: Q2788
Test Name: 8260B
Method No.: VOC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If the temperature of the cooler was elevated (> 10 °C) or bubble size in aqueous sample was too big (tiny bubble is OK.), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP? QAPP say - no HCl preservation.	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous unpreserved - 7 days for aromatic compounds All others - 14 days.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

collected	analyzed		
11/12/02	11/25/02		
11/11/02	11/24/02	11/25/02	
11/13/02	11/27/02	11/25/02	11/26/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per GCMS, 20 samples, batch, matrix, and level)?	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common volatile lab contaminants - methylene chloride, acetone, and 2-butanone) the amount in the associated blank.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If Yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the DV report.	✓		

Notes: MB 11/24/02 See attached MB also contained laboratory artifacts which were crossed out by reviewer- Pos < 5x or 10x B/E
EB's in R2758 , TB in R2758
acetone, 2-butanone → B/X
MeCl3 toluene
unless prev flagged
toluene B/Y

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 15% and %D < ± 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < CL? CL >0.10 for chloromethane, 1,1-dichloroethane, & bromoform or >0.30 for chlorobenzene & 1,1,2,2-tetrachloroethane. If yes, L(+)/R(-).		✓	

Notes: CC 11/27/02
bromomethane -21.4% NDs → UJ,C

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	✓		
5.2	Are BFB enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
5.3	Have all samples been analyzed within twelve hours of the BFB tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for BFB been met for each instrument used?	✓		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?	✓		
	If any system monitoring compound(s) in the volatile fraction is out of specification, there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? DV report should indicate that extraction efficiency/ method accuracy cannot be verified.			✓

	1 or more <10%	1 high/low	2 or 3 high/low	2 or 3 all low	2 or 3 all high
Positives	L	J	J	L	K
Non-detects	R	UJ	UJ	UL	NONE

Note: The B qualifier remains over surrogate flagging.

Notes:

D1 toluene-d8 151, bromofluorobenzene 158% ✓ pos K,S

405547 J,UJ 4 137,

405555 K,S 4 137 11 142 ✓pos K,S

405553 J,UJ 4 124

405B11C 4 125 J,UJ/S 4 136✓

405547RE pos K 4 133

405555RE J,UJ OK 4 138

405553RE J,UJ OK 4 131

405B9FRE 1,2-dCA 140% J,UJ

405B9CRE 3 Sur ?QC pos K,S ✓

405B8F and ?QC pos K,S ✓

405B8FRE 1,2-dCA 54< J,UJ

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached comment only
UJ, in in 40SBQC Parent

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓	✓	
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).		✓	
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes: D-1 all <QC ~~UJ~~, D-1RE 1,4-dichloro— <QC UJ UJ use 40554 R,i use RE-analysis
~~40554, 40555 use~~ R,i 40555 use original (prev. flagged) 40553 use original
~~[illegible] QC [illegible]~~ 71551L 4 4 ~~UJ~~ R,i 40552 use re-analysis
(40554) D-1 R,i unless Prev. — See attached

10.0 Field Duplicate		Yes	No	NA
10.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?			✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			✓

Notes:

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			✓

Notes: Dos TIC → NJ, t

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 33			
12.1.2	Number of target compounds in each analysis: 48			
12.1.3	Number of results rejected and not reported:			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 94%.			

Notes:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1016

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-7

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-7A52

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	3	J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1010

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-5

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-5B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB1004

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-2

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-2B52

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB1003

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-1B52

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-6A52

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride ✓	3	J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-1DL

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-3B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	25	U
74-87-3	Chloromethane	25	U
75-01-4	Vinyl Chloride	25	U
74-83-9	Bromomethane	25	U
75-00-3	Chloroethane	25	U
75-69-4	Trichlorofluoromethane	25	U
75-35-4	1,1-Dichloroethene	25	U
75-15-0	Carbon disulfide	25	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	25	U
67-64-1	Acetone	890	D
75-09-2	Methylene Chloride	25	U
156-60-5	trans-1,2-Dichloroethene	25	U
1634-04-4	Methyl-tert-butyl ether	25	U
75-34-3	1,1-Dichloroethane	25	U
156-59-2	cis-1,2-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	25	U
71-55-6	1,1,1-Trichloroethane	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
78-87-5	1,2-Dichloropropane	25	U
75-27-4	Bromodichloromethane	25	U
10061-01-5	cis-1,3-Dichloropropene	25	U
108-10-1	4-Methyl-2-pentanone	63	U
108-88-3	Toluene	6	DJ
10061-02-6	trans-1,3-Dichloropropene	25	U
79-00-5	1,1,2-Trichloroethane	25	U
127-18-4	Tetrachloroethene	25	U
591-78-6	2-hexanone	63	U
124-48-1	Dibromochloromethane	25	U
106-93-4	1,2-Dibromoethane	25	U

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FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-3B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	1200	E J, B C
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	12	J
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U R, Q
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM I VOA

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE N

VBLKSR

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID: WG21367-2RB71 Lab Sample ID: WG21367-2

Date Analyzed: 11/24/02 Time Analyzed: 1802

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972HP71

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VSRLCS	WG21367-5	WG21367-5B71	1828
02	40SB12A	Q2788-1	Q2788-1RB71	1854
03	40SB12B	Q2788-2	Q2788-2B71	1919
04	40SB12C	Q2788-3	Q2788-3B71	1945
05	71SB11	Q2788-4	Q2788-4B71	2010
06	D-1	Q2788-6	Q2788-6B71	2102
07	40SS4	Q2788-7	Q2788-7B71	2127
08	40SS5	Q2788-8	Q2788-8B71	2153
09	71SS11	Q2788-9	Q2788-9B71	2219
10	40SS3	Q2788-10	Q2788-10B71	2244
11	40SS2	Q2788-11	Q2788-11B71	2310
12	40SS1	Q2788-12	Q2788-12B71	2336
13	40SB11F	Q2788-13	Q2788-13B71	0001
14	40SB11B	Q2788-14	Q2788-14B71	0027
15	40SB11C	Q2788-15	Q2788-15B71	0053
16	40SB9A	Q2788-16	Q2788-16B71	0118
17	40SB9F	Q2788-17	Q2788-17B71	0144
18	40SB9C	Q2788-18	Q2788-18B71	0210
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKSR

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21367-2

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21367-2RB71

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane ✓	0.5	J
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone ✓	1	J
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene ✓	0.7	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKSR

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21367-2

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21367-2RB71

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	0.3	J
95-50-1	1,2-Dichlorobenzene	0.3	J
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	0.4	J
1330-20-7	Xylene (total)	15	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKSR

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21367-2

Sample wt/vol: 5.00 (g/mL) G Lab File ID: WG21367-2RB71

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/24/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		LABORATORY ARTIFACT	11.24	33.71	J
2.		LABORATORY ARTIFACT	12.37	36.37	J
3.		LABORATORY ARTIFACT	13.71	17.68	J
4.					
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FORM I VOA-TIC

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO

VBLKSQ

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID: WG21367-1A62 Lab Sample ID: WG21367-1

Date Analyzed: 11/25/02 Time Analyzed: 1637

GC Column: RTX-VMS ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5973HP62

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VSQLCS	WG21367-4	WG21367-4A62	1712
02	71SS12	Q2788-5	Q2788-5RA62	1753
03	D-1RE	Q2788-6	Q2788-6RA62	1821
04	40SS4RE	Q2788-7	Q2788-7RA62	1847
05	40SS5RE	Q2788-8	Q2788-8RA62	1913
06	71SS11RE	Q2788-9	Q2788-9RA62	1939
07	40SS3RE	Q2788-10	Q2788-10RA62	2005
08	40SS2RE	Q2788-11	Q2788-11RA62	2031
09	40SS1RE	Q2788-12	Q2788-12RA62	2057
10	40SB11FRE	Q2788-13	Q2788-13RA62	2123
11	40SB11BRE	Q2788-14	Q2788-14RA62	2251
12	40SB11CRE	Q2788-15	Q2788-15RA62	2345
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKSQ

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21367-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21367-1A62

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/25/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	3	J
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	15	
75-09-2	Methylene Chloride	3	J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE N

VBLKUA

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID: WG21421-1RA62 Lab Sample ID: WG21421-1

Date Analyzed: 11/26/02 Time Analyzed: 1520

GC Column: RTX-VMS ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5973HP62

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VUALCS	WG21421-4	WG21421-4RA6	1658
02	40SB9FRE	Q2788-17	Q2788-17RA62	1728
03	40SB9CRE	Q2788-18	Q2788-18RA62	1758
04	40SB9CMS	WG21367-6	WG21367-6RA6	1828
05	40SB9CMSD	WG21367-7	WG21367-7RA6	1858
06	40SB8F	Q2788-20	Q2788-2062	1959
07				
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKUA

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21421-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21421-1RA62

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKUA

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21421-1

Sample wt/vol: 5.00 (g/mL) G Lab File ID: WG21421-1RA62

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		LABORATORY ARTIFACT	3.28	5.50	J
2.		LABORATORY ARTIFACT	4.40	73.32	J
3.		LABORATORY ARTIFACT	5.23	87.11	J
4.		LABORATORY ARTIFACT	5.92	18.75	J
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6.					
7.					
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FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO

VBLKUB

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID: WG21421-2A61 Lab Sample ID: WG21421-2

Date Analyzed: 11/27/02 Time Analyzed: 1052

GC Column: RTX-VMS ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5973HP61

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VUBLCS	WG21421-5	WG21421-5A61	1126
02	40SB8A	Q2788-19	Q2788-19RA61	1436
03	40SB8FRE	Q2788-20	Q2788-20RA61	1506
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKUB

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21421-2

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21421-2A61

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM I VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Instrument ID: 5973HP61 Calibration Date: 11/27/02 Time: 1017

Lab File ID: CU021127A61 Init. Calib. Date(s): 11/26/02 11/26/02

Init. Calib. Times: 1023 1254

GC Column: RTX-VMS ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.4080000	0.3588213	0.3588213	0.001	-12.05	90.00	AVRG
Chloromethane	0.6460000	0.5396986	0.5396986	0.1	-16.46	90.00	AVRG
Vinyl Chloride	0.5430000	0.4597170	0.4597170	0.001	-15.34	20.00	AVRG
Bromomethane	0.3250000	0.2553295	0.2553295	0.001	-21.44	90.00	AVRG
Chloroethane	0.2850000	0.2337788	0.2337788	0.001	-17.97	90.00	AVRG
Trichlorofluoromethane	241.00544	250.00000	0.5251832	0.001	-3.60	90.00	2RDR
1,1-Dichloroethene	0.2480000	0.2347992	0.2347992	0.001	-5.32	20.00	AVRG
Carbon disulfide	0.7990000	0.7278933	0.7278933	0.001	-8.90	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	0.3500000	0.3123301	0.3123301	0.001	-10.76	90.00	AVRG
Acetone	585.62410	625.00000	0.1038715	0.001	-6.30	90.00	2RDR
Methylene Chloride	244.07924	250.00000	0.3052367	0.001	-2.37	90.00	2RDR
trans-1,2-Dichloroethene	0.2680000	0.2509136	0.2509136	0.001	-6.38	90.00	AVRG
Methyl-tert-butyl ether	0.7250000	0.6977345	0.6977345	0.001	-3.76	90.00	AVRG
1,1-Dichloroethane	0.5460000	0.4837127	0.4837127	0.1	-11.41	90.00	AVRG
cis-1,2-Dichloroethene	0.2840000	0.2580884	0.2580884	0.001	-9.12	90.00	AVRG
2-butanone	0.1980000	0.1675370	0.1675370	0.001	-15.38	90.00	AVRG
Chloroform	0.4710000	0.4226828	0.4226828	0.001	-10.26	20.00	AVRG
1,1,1-Trichloroethane	0.3410000	0.3004224	0.3004224	0.001	-11.90	90.00	AVRG
Carbon Tetrachloride	0.3480000	0.3051494	0.3051494	0.001	-12.31	90.00	AVRG
Benzene	1.0050000	0.8883566	0.8883566	0.001	-11.61	90.00	AVRG
1,2-Dichloroethane	0.3480000	0.2989805	0.2989805	0.001	-14.09	90.00	AVRG
Trichloroethene	0.1530000	0.1532884	0.1532884	0.001	0.19	90.00	AVRG
1,2-Dichloropropane	0.2230000	0.2264906	0.2264906	0.001	1.56	20.00	AVRG
Bromodichloromethane	259.79884	250.00000	0.2163766	0.001	3.92	90.00	2RDR
cis-1,3-Dichloropropene	235.67668	250.00000	0.2895264	0.001	-5.73	90.00	2RDR
4-Methyl-2-pentanone	628.95109	625.00000	0.4418272	0.001	0.63	90.00	2RDR
Toluene	0.6820000	0.6978820	0.6978820	0.001	2.33	20.00	AVRG
trans-1,3-Dichloropropene	271.20178	250.00000	0.4159625	0.001	8.48	90.00	2RDR
1,1,2-Trichloroethane	258.97208	250.00000	0.3066247	0.001	3.59	90.00	2RDR
Tetrachloroethene	0.2390000	0.2421321	0.2421321	0.001	1.31	90.00	AVRG
2-hexanone	614.55582	625.00000	0.3250348	0.001	-1.67	90.00	2RDR
Dibromochloromethane	0.3220000	0.3298973	0.3298973	0.001	2.45	90.00	AVRG
1,2-Dibromoethane	259.86345	250.00000	0.3056682	0.001	3.94	90.00	2RDR
Chlorobenzene	0.9010000	0.8708604	0.8708604	0.3	-3.34	90.00	AVRG
Ethylbenzene	0.4460000	0.4315333	0.4315333	0.001	-3.24	20.00	AVRG
Styrene	254.14998	250.00000	0.8423877	0.001	1.66	90.00	2RDR
Bromoform	244.20795	250.00000	0.2772624	0.1	-2.32	90.00	2RDR
Isopropyl Benzene	1.3390000	1.3137961	1.3137961	0.001	-1.88	90.00	AVRG
1,1,2,2-Tetrachloroethane	0.8140000	0.7943170	0.7943170	0.3	-2.42	90.00	AVRG
1,3-Dichlorobenzene	1.2580000	1.1422510	1.1422510	0.001	-9.20	90.00	AVRG
1,4-Dichlorobenzene	1.5270000	1.3963569	1.3963569	0.001	-8.56	90.00	AVRG
1,2-Dichlorobenzene	1.2880000	1.1674287	1.1674287	0.001	-9.36	90.00	AVRG

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Level: (low/med) LOW

	CLIENT SAMPLE NO.	SMC1 (DBF) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	VBLKSR	105	116	114	112	0
02	VSRLCS	120	125	118	109	0
03	40SB12A	101	109	103	100	0
04	40SB12B	113	117	113	108	0
05	40SB12C	102	110	109	99	0
06	71SB11	112	118	112	107	0
07	D-1	130	132	151*	158*	2
08	40SS4	113	110	137*	127	1
09	40SS5	111	109	137*	142*	2
10	71SS11	122	129	117	123	0
11	40SS3	124	128	124*	125	1
12	40SS2	114	118	119	122	0
13	40SS1	106	110	106	103	0
14	40SB11F	114	126	116	123	0
15	40SB11B	105	106	106	113	0
16	40SB11C	114	115	125*	124	1
17	40SB9A	108	110	113	112	0
18	40SB9F	106	114	107	108	0
19	40SB9C	116	118	122	118	0
20	VBLKSQ	104	96	107	108	0
21	VSQLCS	104	95	104	97	0
22	71SS12	91	91	92	97	0
23	D-1RE	94	94	100	115	0
24	40SS4RE	112	116	133*	136*	2
25	40SS5RE	118	115	122	138*	1
26	71SS11RE	110	107	110	128	0
27	40SS3RE	110	113	110	131*	1
28	40SS2RE	102	109	96	107	0

		QC LIMITS
SMC1 (DBF)	= Dibromofluoromethane	(71-141)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(70-139)
SMC3 (TOL)	= Toluene-d8	(72-123)
SMC4 (BFB)	= Bromofluorobenzene	(65-131)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Level: (low/med) LOW

	CLIENT SAMPLE NO.	SMC1 (DBF) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	40SS1RE	107	115	98	119	0
02	40SB11FRE	102	105	102	100	0
03	40SB11BRE	108	112	108	101	0
04	40SB11CRE	109	119	101	110	0
05	VBLKUA	107	105	114	103	0
06	VUALCS	78	82	86	82	0
07	40SB9FRE	124	140*	121	94	1
08	40SB9CRE	138	153*	134*	140*	3
09	40SB9CMS	134	152*	126*	126	2
10	40SB9CMSD	147*	166*	128*	137*	4
11	40SB8F	132	150*	167*	140*	3
12	VBLKUB	100	99	106	87	0
13	VUBLCS	90	93	97	82	0
14	40SB8A	90	95	102	91	0
15	40SB8FRE	78	59*	120	93	1
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		QC LIMITS
SMC1 (DBF)	= Dibromofluoromethane	(71-141)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(70-139)
SMC3 (TOL)	= Toluene-d8	(72-123)
SMC4 (BFB)	= Bromofluorobenzene	(65-131)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 3
SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - Sample No.: 40SB9C Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	80	2	46	55	50-150
Chloromethane	80	0.00	76	95	50-150
Vinyl Chloride	80	0.00	60	75	50-150
Bromomethane	80	0.00	12	15*	50-150
Chloroethane	80	0.00	42	53	50-150
Trichlorofluoromethane	80	0.00	90	110	50-150
1,1-Dichloroethene	80	0.00	80	100	50-150
Carbon disulfide	80	31	120	110	50-150
1,1,2-trichloro-1,2,2-t	80	0.00	92	120	50-150
Acetone	200	94	810	360*	50-150
Methylene Chloride	80	4.1	86	100	50-150
trans-1,2-Dichloroethen	80	0.00	73	91	50-150
Methyl-tert-butyl ether	80	0.00	100	130	50-150
1,1-Dichloroethane	80	0.00	81	100	50-150
cis-1,2-Dichloroethene	80	0.00	78	98	50-150
2-butanone	200	0.00	700	350*	50-150
Chloroform	80	0.00	84	110	50-150
1,1,1-Trichloroethane	80	0.00	82	100	50-150
Carbon Tetrachloride	80	0.00	78	98	50-150
Benzene	80	0.00	77	96	50-150
1,2-Dichloroethane	80	0.00	86	110	50-150
Trichloroethene	80	18	81	79	50-150
1,2-Dichloropropane	80	0.00	87	110	50-150
Bromodichloromethane	80	0.00	88	110	50-150
cis-1,3-Dichloropropene	80	0.00	60	75	50-150
4-Methyl-2-pentanone	200	14	660	320*	50-150
Toluene	80	11	81	88	50-150
trans-1,3-Dichloroprope	80	0.00	80	100	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - Sample No.: 40SB9C Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
1,1,2-Trichloroethane	80	0.00	82	100	50-150
Tetrachloroethene	80	0.00	74	93	50-150
2-hexanone	200	0.00	630	320*	50-150
Dibromochloromethane	80	0.00	96	120	50-150
1,2-Dibromoethane	80	0.00	89	110	50-150
Chlorobenzene	80	0.00	78	98	50-150
Ethylbenzene	80	3.2	78	94	50-150
Styrene	80	2.3	60	72	50-150
Bromoform	80	0.00	92	120	50-150
Isopropyl Benzene	80	0.00	79	99	50-150
1,1,2,2-Tetrachloroetha	80	0.00	140	180*	50-150
1,3-Dichlorobenzene	80	0.00	79	99	50-150
1,4-Dichlorobenzene	80	0.00	78	98	50-150
1,2-Dichlorobenzene	80	0.00	94	120	50-150
1,2-Dibromo-3-Chloropro	80	0.00	140	180*	50-150
1,2,4-Trichlorobenzene	80	0.00	56	70	50-150
Xylene (total)	240	20	230	88	50-150
Methyl acetate	80	0.00	150	190*	50-150
Cyclohexane	80	0.00	91	110	50-150
Methylcyclohexane	80	0.00	87	110	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - Sample No.: 40SB9C Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	120	63	51	31	40	50-150
Chloromethane	120	160	130	71*	40	50-150
Vinyl Chloride	120	84	70	33	40	50-150
Bromomethane	120	20	17*	50*	40	50-150
Chloroethane UJ, M	120	38	32*	10	40	50-150
Trichlorofluoromethane	120	110	92	20	40	50-150
1,1-Dichloroethene	120	130	110	48*	40	50-150
Carbon disulfide	120	190	130	45*	40	50-150
1,1,2-trichloro-1,2,2-t	120	140	120	41*	40	50-150
Acetone	290	1200	380*	39	40	50-150
Methylene Chloride	120	150	120	54*	40	50-150
trans-1,2-Dichloroethen	120	120	100	49*	40	50-150
Methyl-tert-butyl ether	120	170	140	52*	40	50-150
1,1-Dichloroethane	120	130	110	46*	40	50-150
cis-1,2-Dichloroethene	120	130	110	50*	40	50-150
2-butanone	290	1200	410*	53*	40	50-150
Chloroform	120	130	110	43*	40	50-150
1,1,1-Trichloroethane	120	130	110	45*	40	50-150
Carbon Tetrachloride	120	130	110	50*	40	50-150
Benzene	120	130	110	51*	40	50-150
1,2-Dichloroethane	120	140	120	48*	40	50-150
Trichloroethene	120	130	93	46*	40	50-150
1,2-Dichloropropane	120	140	120	47*	40	50-150
Bromodichloromethane	120	150	130	52*	40	50-150
cis-1,3-Dichloropropene	120	98	82	48*	40	50-150
4-Methyl-2-pentanone	290	1100	370*	50*	40	50-150
Toluene	120	130	100	46*	40	50-150
trans-1,3-Dichloroprope	120	130	110	48*	40	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - Sample No.: 40SB9C Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1,2-Trichloroethane	120	130	110	45*	40	50-150
Tetrachloroethene	120	110	92	39	40	50-150
2-hexanone	290	1100	380*	54*	40	50-150
Dibromochloromethane	120	150	130	44*	40	50-150
1,2-Dibromoethane	120	140	120	44*	40	50-150
Chlorobenzene	120	120	100	42*	40	50-150
Ethylbenzene	120	120	97	42*	40	50-150
Styrene	120	88	71	38	40	50-150
Bromoform	120	140	120	41*	40	50-150
Isopropyl Benzene	120	120	100	41*	40	50-150
1,1,2,2-Tetrachloroetha	120	230	190*	49*	40	50-150
1,3-Dichlorobenzene	120	120	100	41*	40	50-150
1,4-Dichlorobenzene	120	120	100	42*	40	50-150
1,2-Dichlorobenzene	120	140	120	39	40	50-150
1,2-Dibromo-3-Chloropro	120	250	210*	56*	40	50-150
1,2,4-Trichlorobenzene	120	100	83	56*	40	50-150
Xylene (total)	350	340	91	38	40	50-150
Methyl acetate	120	240	200*	46*	40	50-150
Cyclohexane	120	140	120	42*	40	50-150
Methylcyclohexane	120	140	120	47*	40	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 39 out of 48 outside limits
Spike Recovery: 17 out of 96 outside limits

COMMENTS: _____

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID (Standard): CT021124B71 Date Analyzed: 11/24/02

Instrument ID: 5972HP71 Time Analyzed: 1655

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	697079	8.42	487903	10.62	237761	12.08
	UPPER LIMIT	1394158	8.92	975806	11.12	475522	12.58
	LOWER LIMIT	348540	7.92	243952	10.12	118880	11.58
	CLIENT SAMPLE NO.						
01	VBLKSR	640380	8.41	406056	10.62	191490	12.08
02	VSRLCS	596782	8.42	427994	10.62	212320	12.08
03	40SB12A	722278	8.41	460699	10.62	209700	12.08
04	40SB12B	626085	8.41	400186	10.62	179112	12.08
05	40SB12C	554050	8.41	344209	10.62	161292	12.08
06	71SB11	472599	8.42	286253	10.62	119327	12.09
07	D-1	337282*	8.41	151793*	10.62	42320*	12.08
08	40SS4	441726	8.41	212569*	10.61	65462*	12.08
09	40SS5	380438	8.42	163043*	10.62	42099*	12.08
10	71SS11 use	474755	8.42	289847	10.62	114903*	12.08
11	40SS3 use	487658	8.41	273118	10.61	105099*	12.08
12	40SS2 Do not use	433584	8.42	238995*	10.62	87311*	12.08
13	40SS1 use	481851	8.41	268957	10.61	100922*	12.08
14	40SB11F use	508885	8.42	276262	10.62	92608*	12.08
15	40SB11B use	531579	8.42	307202	10.62	114064*	12.08
16	40SB11C Do not use	494212	8.42	274711	10.62	108344*	12.08
17	40SB9A	501664	8.41	298176	10.61	123369	12.08
18	40SB9F use	507854	8.41	293421	10.61	113254*	12.08
19	40SB9C use	429908	8.42	247397	10.62	97301*	12.08
20							

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID (Standard): CB021125A62 Date Analyzed: 11/25/02

Instrument ID: 5973HP62 Time Analyzed: 1448

GC Column: RTX-VMS ID: 0.18 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA	#	RT	#	IS2(CBZ) AREA	#	RT	#	IS3(DCB) AREA	#	RT	#
	12 HOUR STD	534645		2.57		335137		3.87		195206		5.84	
	UPPER LIMIT	1069290		3.07		670274		4.37		390412		6.34	
	LOWER LIMIT	267322		2.07		167568		3.37		97603		5.34	
	CLIENT SAMPLE NO.												
01	VBLKSQ	806619		2.57		471536		3.87		233407		5.85	
02	VSQLCS	786072		2.57		493326		3.87		274993		5.84	
03	71SS12	851641		2.56		471135		3.87		167454		5.85	
04	D-1RE	577800		2.56		269324		3.87		75564	*	5.86	
05	40SS4RE	455315		2.57		182595		3.87		54937	*	5.86	
06	40SS5RE	358789		2.57		143926	*	3.87		32687	*	5.87	
07	71SS11RE Do not use	384093		2.56		199872		3.87		63636	*	5.85	
08	40SS3RE	400389		2.57		209442		3.87		70671	*	5.85	
09	40SS2RE use	385680		2.57		219853		3.87		90424	*	5.84	
10	40SS1RE Do not use	344772		2.57		201772		3.87		77627	*	5.85	
11	40SB11FRE Do not use	361385		2.57		195839		3.87		81038	*	5.85	
12	40SB11BRE Do not use	346848		2.57		210099		3.87		96435	*	5.85	
13	40SB11CRE use	302199		2.57		179283		3.87		77135	*	5.85	
14													
15													
16													
17													
18													
19													
20													

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID (Standard): CZ021126A62 Date Analyzed: 11/26/02

Instrument ID: 5973HP62 Time Analyzed: 1208

GC Column: RTX-VMS ID: 0.18 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	326861	2.61	220854	3.86	141392	4.93
	UPPER LIMIT	653722	3.11	441708	4.36	282784	5.43
	LOWER LIMIT	163430	2.11	110427	3.36	70696	4.43
	CLIENT SAMPLE NO.						
01	VBLKUA	318562	2.61	176784	3.86	100409	4.94
02	VUALCS	338939	2.61	224581	3.86	135764	4.94
03	40SB9FRE Do not use	278599	2.61	153739	3.86	74058	4.93
04	40SB9CRE Do not use	275611	2.61	155814	3.86	60667*	4.94
05	40SB9CMS	280649	2.61	161516	3.86	75658	4.94
06	40SB9CMSD	261011	2.61	157050	3.86	71727	4.94
07	40SB8F use	294922	2.61	126280	3.86	41002*	4.94
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID (Standard): CU021127A61 Date Analyzed: 11/27/02

Instrument ID: 5973HP61 Time Analyzed: 1017

GC Column: RTX-VMS ID: 0.18 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA	#	RT	#	IS2(CBZ) AREA	#	RT	#	IS3(DCB) AREA	#	RT	#
	12 HOUR STD	343979		2.61		239423		3.86		164034		4.94	
	UPPER LIMIT	687958		3.11		478846		4.36		328068		5.44	
	LOWER LIMIT	171990		2.11		119712		3.36		82017		4.44	
	CLIENT SAMPLE NO.												
01	VBLKUB	317579		2.61		215663		3.86		120449		4.94	
02	VUBLCS	315630		2.61		242429		3.86		159533		4.94	
03	40SB8A	346471		2.61		216704		3.86		112727		4.94	
04	40SB8FRE Do not use	233418		2.62		117793*		3.86		38253*		4.94	
05													
06													
07													
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16													
17													
18													
19													
20													

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 2/5/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: Q2788
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	✓		
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes: It was noted by lab on COC received 11/12/02 715S11 appeared twice - containers for collection at 14:45 were labeled 715B11. Lab was instructed to use the ID on the containers: 715B11.

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

Collected	Extracted	Analyzed
11/13,02	11/16/02	11/19,02
11/12,02	11/13,02	11/14P2
11/11/02	11/22,02	11/24,02
11/13,02		

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes: → MBs contained TICs which were crossed out in samples. ←

in R2788 (EQB-2 caprolactam 22 ug/L
EQB-1 4 21) ~~[illegible]~~
pos 75 x, no action

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes: See attached IC atrazine ND → UJ,r in all pos. J,r for the rest

ND UJ,c or J,c (+)

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

	1 or more <10%	2 or 3 high/low	2 or 3 all low	2 or 3 all high
Positives	L	J	L	K
Non-detects	R	UJ	UL	NONE

Note: The B qualifier remains over surrogate flagging.

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: See attached
Parent sample 405B9C all ND, no flag

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: see attached all ND, no flags

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			✓

Notes:

POS. TIC → NJ16

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = _____			

Notes:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKTU

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21346-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: WG21346-1A64

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	380	J
2.		UNKNOWN (BC)	5.76	300	J
3.	695-98-7	PYRIDINE, 2,3,5-TRIMETHYL-	6.30	170	NJ
4.		UNKNOWN (BC)	6.41	150	J
5.		UNKNOWN (BC)	6.98	150	J
6.		UNKNOWN (BC)	7.08	690	J
7.	826-36-8	4-PIPERIDINONE, 2,2,6,6-TETR	7.45	320	NJ
8.		UNKNOWN (BC)	7.83	140	J
9.					
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11.					
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29.					
30.					

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKUR

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21407-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: WG21407-1B64

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.48	440	J
2.		UNKNOWN (BC)	5.75	990	J
3.		UNKNOWN (BC)	7.02	300	J
4.		UNKNOWN (BC)	7.07	150	J
5.		UNKNOWN (BC)	7.76	130	J
6.					
7.					
8.					
9.					
10.					
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30.					

FORM I SV-TIC

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Instrument ID: 5972HP64 Calibration Date(s): 11/07/02 11/07/02

Column: ID: 0.00 (mm) Calibration Time(s): 1136 1432

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Benzaldehyde	AVRG	1.30274490	17.843	50.000
Phenol	AVRG	1.89772952	14.412	30.000
Bis(2-chloroethyl)ether	AVRG	1.70855836	17.883	50.000
2-Chlorophenol	AVRG	1.42767624	11.067	50.000
2-Methylphenol	AVRG	1.38385997	14.848	50.000
2,2'-oxybis(1-Chloropropane)	AVRG	2.26955619	28.290	50.000
Acetophenone	AVRG	2.24511262	11.534	50.000
4-Methylphenol	AVRG	1.31694907	21.060	50.000
N-Nitroso-di-N-propylamine	AVRG	1.02388610	17.495	50.000
Hexachloroethane	AVRG	0.65768903	17.691	50.000
Nitrobenzene	AVRG	0.49424158	12.840	50.000
Isophorone	AVRG	0.86333819	5.273	50.000
2-Nitrophenol	AVRG	0.22874976	4.131	30.000
2,4-Dimethylphenol	AVRG	0.29036084	10.350	50.000
Bis(2-chloroethoxy)methane	AVRG	0.51766496	14.117	50.000
2,4-Dichlorophenol	AVRG	0.30415530	9.875	30.000
Naphthalene	AVRG	1.00744559	15.336	50.000
4-Chloroaniline	AVRG	0.49164580	12.444	50.000
Hexachlorobutadiene	AVRG	0.21210074	11.494	30.000
Caprolactam	AVRG	0.16108307	6.234	50.000
4-Chloro-3-methylphenol	AVRG	0.34308590	15.332	30.000
2-Methylnaphthalene	AVRG	0.66917294	16.097	50.000
Hexachlorocyclopentadiene	AVRG	0.39707275	8.476	50.000
2,4,6-Trichlorophenol	AVRG	0.46099466	14.822	30.000
2,4,5-Trichlorophenol	AVRG	0.54672600	15.253	50.000
1,1'-Biphenyl	AVRG	1.41212336	6.435	50.000
2-Chloronaphthalene	AVRG	1.06227993	14.872	50.000
2-Nitroaniline	AVRG	0.54374147	14.279	50.000
Dimethylphthalate	AVRG	1.55784112	15.768	50.000
2,6-Dinitrotoluene	AVRG	0.35192001	11.110	50.000
Acenaphthylene	AVRG	1.98732162	22.266	50.000
3-Nitroaniline	AVRG	0.37739775	9.590	50.000
Acenaphthene	AVRG	1.14340489	24.399	30.000
2,4-Dinitrophenol	AVRG	0.21014182	13.366	50.000
4-Nitrophenol	AVRG	0.29561108	13.352	50.000
2,4-Dinitrotoluene	AVRG	0.49249320	10.422	50.000
Dibenzofuran	AVRG	1.70152915	20.994	50.000
Diethylphthalate	AVRG	1.46943798	11.427	50.000
4-Chlorophenyl-phenylether	AVRG	0.62257129	13.017	50.000
Fluorene	AVRG	1.22227487	18.557	50.000
4-Nitroaniline	AVRG	0.40558873	9.844	50.000
4,6-Dinitro-2-methylphenol	AVRG	0.18108206	17.302	50.000
N-Nitrosodiphenylamine	AVRG	0.43337702	24.984	30.000
4-Bromophenyl-phenylether	AVRG	0.22905383	15.788	50.000

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Instrument ID: 5972HP64 Calibration Date(s): 11/07/02 11/07/02

Column: ID: 0.00 (mm) Calibration Time(s): 1136 1432

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Hexachlorobenzene	AVRG	0.25802471	11.592	50.000
Atrazine	AVRG	0.14249846	57.888	50.000
Pentachlorophenol	AVRG	0.17358015	15.876	30.000
Phenanthrene	AVRG	1.14457079	16.162	50.000
Anthracene	AVRG	1.17007834	15.758	50.000
Carbazole	AVRG	1.02103502	15.471	50.000
Di-n-butylphthalate	AVRG	1.60006539	13.559	50.000
Fluoranthene	AVRG	1.23918214	12.665	30.000
Pyrene	AVRG	1.48312678	12.989	50.000
Butylbenzylphthalate	AVRG	0.81574757	12.835	50.000
3,3'-Dichlorobenzidine	AVRG	0.40469248	16.429	50.000
bis(2-ethylhexyl)Phthalate	AVRG	1.11348579	14.270	50.000
Benzo(a)anthracene	AVRG	1.30138787	10.948	50.000
Chrysene	AVRG	1.13203135	16.507	50.000
Di-n-octylphthalate	AVRG	2.49352026	14.269	30.000
Benzo(b)fluoranthene	AVRG	1.78990242	6.511	50.000
Benzo(k)fluoranthene	AVRG	1.65203991	23.605	50.000
Benzo(a)pyrene	AVRG	1.46565601	12.241	30.000
Indeno(1,2,3-cd)pyrene	AVRG	1.37879157	11.869	50.000
Dibenzo(a,h)anthracene	AVRG	1.26812413	16.930	50.000
Benzo(g,h,i)perylene	AVRG	1.32820866	13.834	50.000
2-Fluorophenol	AVRG	1.85599370	3.533	50.000
Phenol-d5	AVRG	2.07305220	12.044	50.000
Nitrobenzene-d5	AVRG	0.54999573	9.750	50.000
2-Fluorobiphenyl	AVRG	1.40167410	20.101	50.000
2,4,6-Tribromophenol	AVRG	0.30417964	7.601	50.000
Terphenyl-d14	AVRG	0.95927827	11.890	50.000

Average %RSD test result.

Calculate Average %RSD: 14.35896301
Maximum Average %RSD: 15.00000000

Note: Passes Average %RSD Test.

FORM VI SV

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID: DF021114A64 DFTPP Injection Date: 11/14/02

Instrument ID: 5972HP64 DFTPP Injection Time: 0949

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	41.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	60.5
70	Less than 2.0% of mass 69	0.3 (0.4)1
127	25.0 - 75.0% of mass 198	40.0
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.3
275	10.0 - 30.0% of mass 198	17.7
365	Greater than 0.75% of mass 198	2.13
441	Present, but less than mass 443	8.9
442	40.0 - 110.0% of mass 198	62.4
443	15.0 - 24.0% of mass 442	12.0 (19.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD080	SSTD080	HG021114A64	11/14/02	1015
02	SBLKTU	WG21346-1	WG21346-1A64	11/14/02	1059
03	40SB12A	Q2788-1	Q2788-1A64	11/14/02	1208
04	40SB12B	Q2788-2	Q2788-2A64	11/14/02	1243
05	40SB12C	Q2788-3	Q2788-3A64	11/14/02	1318
06	STULCS	WG21346-2	WG21346-2JA64	11/14/02	1353
07	71SB11	Q2788-4	Q2788-4A64	11/14/02	1428
08	71SS12	Q2788-5	Q2788-5A64	11/14/02	1503
09	D-1	Q2788-6	Q2788-6A64	11/14/02	1537
10	40SS4	Q2788-7	Q2788-7A64	11/14/02	1613
11	40SS5	Q2788-8	Q2788-8A64	11/14/02	1647
12	71SS11	Q2788-9	Q2788-9A64	11/14/02	1722
13	40SS3	Q2788-10	Q2788-10A64	11/14/02	1757
14	40SS2	Q2788-11	Q2788-11A64	11/14/02	1832
15	40SS1	Q2788-12	Q2788-12A64	11/14/02	1907
16					
17					
18					
19					
20					
21					
22					

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Instrument ID: 5972HP64 Calibration Date: 11/14/02 Time: 1015

Lab File ID: HG021114A64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 " 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Benzaldehyde	1.3030000	1.2448845	0.01	-4.46	50.00	AVRG
Phenol	1.8980000	1.8761267	0.01	-1.15	20.00	AVRG
Bis(2-chloroethyl)ether	1.7080000	1.7462274	0.01	2.24	50.00	AVRG
2-Chlorophenol	1.4280000	1.5198761	0.01	6.43	50.00	AVRG
2-Methylphenol	1.3840000	1.3781882	0.01	-0.42	50.00	AVRG
2,2'-oxybis(1-Chloropropane)	2.2700000	1.8354665	0.01	-19.14	50.00	AVRG
Acetophenone	2.2450000	2.2568905	0.01	0.53	50.00	AVRG
4-Methylphenol	1.3170000	1.2072143	0.01	-8.34	50.00	AVRG
N-Nitroso-di-N-propylamine	1.0240000	0.9956084	0.05	-2.77	50.00	AVRG
Hexachloroethane	0.6580000	0.6769257	0.01	2.88	50.00	AVRG
Nitrobenzene	0.4940000	0.4891661	0.01	-0.98	50.00	AVRG
Isophorone	0.8630000	0.7420201	0.01	-14.02	50.00	AVRG
2-Nitrophenol	0.2290000	0.2320753	0.01	1.34	20.00	AVRG
2,4-Dimethylphenol	0.2900000	0.2951742	0.01	1.78	50.00	AVRG
Bis(2-chloroethoxy)methane	0.5180000	0.4924196	0.01	-4.94	50.00	AVRG
2,4-Dichlorophenol	0.3040000	0.3063348	0.01	0.77	20.00	AVRG
Naphthalene	1.0080000	1.0132736	0.01	0.52	50.00	AVRG
4-Chloroaniline	0.4920000	0.4700172	0.01	-4.47	50.00	AVRG
Hexachlorobutadiene	0.2120000	0.2062473	0.01	-2.71	20.00	AVRG
Caprolactam	0.1610000	0.1433688	0.01	-10.95	50.00	AVRG
4-Chloro-3-methylphenol	0.3430000	0.3585796	0.01	4.54	20.00	AVRG
2-Methylnaphthalene	0.6690000	0.6869041	0.01	2.68	50.00	AVRG
Hexachlorocyclopentadiene	0.3970000	0.5592323	0.05	40.86	50.00	AVRG
2,4,6-Trichlorophenol	0.4610000	0.4724053	0.01	2.47	20.00	AVRG
2,4,5-Trichlorophenol	0.5470000	0.5866309	0.01	7.24	50.00	AVRG
1,1'-Biphenyl	1.4120000	1.2624305	0.01	-10.59	50.00	AVRG
2-Chloronaphthalene	1.0620000	0.9991367	0.01	-5.92	50.00	AVRG
2-Nitroaniline	0.5440000	0.4877459	0.01	-10.34	50.00	AVRG
Dimethylphthalate	1.5580000	1.5674577	0.01	0.61	50.00	AVRG
2,6-Dinitrotoluene	0.3520000	0.3303155	0.01	-6.16	50.00	AVRG
Acenaphthylene	1.9870000	1.8975038	0.01	-4.50	50.00	AVRG
3-Nitroaniline	0.3770000	0.4126814	0.01	9.46	50.00	AVRG
Acenaphthene	1.1430000	1.1201757	0.01	-2.00	20.00	AVRG
2,4-Dinitrophenol	0.2100000	0.2230477	0.05	6.21	50.00	AVRG
4-Nitrophenol	0.2960000	0.3396229	0.05	14.74	50.00	AVRG
2,4-Dinitrotoluene	0.4930000	0.4689210	0.01	-4.88	50.00	AVRG
Dibenzofuran	1.7020000	1.6068748	0.01	-5.59	50.00	AVRG
Diethylphthalate	1.4700000	1.6276252	0.01	10.72	50.00	AVRG
4-Chlorophenyl-phenylether	0.6220000	0.6942308	0.01	11.61	50.00	AVRG
Fluorene	1.2220000	1.1991201	0.01	-1.87	50.00	AVRG
4-Nitroaniline	0.4060000	0.4361028	0.01	7.41	50.00	AVRG
4,6-Dinitro-2-methylphenol	0.1810000	0.2007892	0.01	10.93	50.00	AVRG

acceptable no flagging

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Instrument ID: 5972HP64 Calibration Date: 11/14/02 Time: 1015

Lab File ID: HG021114A64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
N-Nitrosodiphenylamine	0.4340000	0.3820945	0.01	-11.96	20.00	AVRG
4-Bromophenyl-phenylether	0.2290000	0.2382421	0.01	4.04	50.00	AVRG
Hexachlorobenzene	0.2580000	0.2595762	0.01	0.61	50.00	AVRG
Atrazine	0.1420000	0.0945784	0.01	-33.40	50.00	AVRG
Pentachlorophenol	0.1740000	0.1693585	0.05	-2.67	20.00	AVRG
Phenanthrene	1.1440000	1.1291067	0.01	-1.30	50.00	AVRG
Anthracene	1.1700000	1.0939746	0.01	-6.50	50.00	AVRG
Carbazole	1.0210000	0.9910596	0.01	-2.93	50.00	AVRG
Di-n-butylphthalate	1.6000000	1.4789732	0.01	-7.56	50.00	AVRG
Fluoranthene	1.2390000	1.2196655	0.01	-1.56	20.00	AVRG
Pyrene	1.4830000	1.3616406	0.01	-8.18	50.00	AVRG
Butylbenzylphthalate	0.8160000	0.8007339	0.01	-1.87	50.00	AVRG
3,3'-Dichlorobenzidine	0.4040000	0.4541412	0.01	12.41	50.00	AVRG
bis(2-ethylhexyl)Phthalate	1.1140000	1.1260430	0.01	1.08	50.00	AVRG
Benzo(a)anthracene	1.3010000	1.3120071	0.01	0.85	50.00	AVRG
Chrysene	1.1320000	1.1427374	0.01	0.95	50.00	AVRG
Di-n-octylphthalate	2.4940000	2.4004427	0.01	-3.75	20.00	AVRG
Benzo(b)fluoranthene	1.7900000	1.5877928	0.01	-11.30	50.00	AVRG
Benzo(k)fluoranthene	1.6520000	1.9686427	0.01	19.17	50.00	AVRG
Benzo(a)pyrene	1.4650000	1.4809996	0.01	1.09	20.00	AVRG
Indeno(1,2,3-cd)pyrene	1.3790000	1.5049783	0.01	9.14	50.00	AVRG
Dibenzo(a,h)anthracene	1.2680000	1.2576753	0.01	-0.81	50.00	AVRG
Benzo(g,h,i)perylene	1.3280000	1.3935538	0.01	4.94	50.00	AVRG
2-Fluorophenol	1.8560000	1.9755967	0.01	6.44	50.00	AVRG
Phenol-d5	2.0730000	2.0901497	0.01	0.83	50.00	AVRG
Nitrobenzene-d5	0.5500000	0.5336927	0.01	-2.96	50.00	AVRG
2-Fluorobiphenyl	1.4020000	1.5129002	0.01	7.91	50.00	AVRG
2,4,6-Tribromophenol	0.3040000	0.3449099	0.01	13.46	50.00	AVRG
Terphenyl-d14	0.9590000	0.9134332	0.01	-4.75	50.00	AVRG

prev. flagged

FORM VII SV

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID: DF021118B64 DFTPP Injection Date: 11/18/02

Instrument ID: 5972HP64 DFTPP Injection Time: 2118

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	41.7
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	57.7
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	25.0 - 75.0% of mass 198	38.2
197	Less than 1.0% of mass 198	0.1
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.7
275	10.0 - 30.0% of mass 198	19.1
365	Greater than 0.75% of mass 198	2.22
441	Present, but less than mass 443	9.8
442	40.0 - 110.0% of mass 198	66.3
443	15.0 - 24.0% of mass 442	12.7 (19.1)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD080	SSTD080	HG021118B64	11/18/02	2139
02	SBLKUR	WG21407-1	WG21407-1B64	11/18/02	2213
03	SURLCS	WG21407-2	WG21407-2B64	11/18/02	2248
04	40SB11F	Q2788-13	Q2788-13B64	11/19/02	0217
05	40SB11B	Q2788-14	Q2788-14B64	11/19/02	0252
06	40SB9A	Q2788-16	Q2788-16B64	11/19/02	0401
07	40SB9C	Q2788-18	Q2788-18B64	11/19/02	0510
08	40SB9CMS	WG21407-3	WG21407-3B64	11/19/02	0545
09	40SB9CMSD	WG21407-4	WG21407-4B64	11/19/02	0619
10	40SB8A	Q2788-19	Q2788-19B64	11/19/02	0654
11	40SB8F	Q2788-20	Q2788-20B64	11/19/02	0728
12					
13					
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FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Instrument ID: 5972HP64 Calibration Date: 11/18/02 Time: 2139

Lab File ID: HG021118B64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
N-Nitrosodiphenylamine	0.4340000	0.3787386	0.01	-12.73	20.00	AVRG
4-Bromophenyl-phenylether	0.2290000	0.1984652	0.01	-13.33	50.00	AVRG
Hexachlorobenzene	0.2580000	0.2362101	0.01	-8.44	50.00	AVRG
Atrazine	0.1420000	0.0787351	0.01	-44.55	50.00	AVRG
Pentachlorophenol	0.1740000	0.1487966	0.05	-14.48	20.00	AVRG
Phenanthrene	1.1440000	0.9093286	0.01	-20.51	50.00	AVRG
Anthracene	1.1700000	0.9373159	0.01	-19.89	50.00	AVRG
Carbazole	1.0210000	0.8905087	0.01	-12.78	50.00	AVRG
Di-n-butylphthalate	1.6000000	1.2398465	0.01	-22.51	50.00	AVRG
Fluoranthene	1.2390000	1.0423964	0.01	-15.87	20.00	AVRG
Pyrene	1.4830000	1.3736271	0.01	-7.38	50.00	AVRG
Butylbenzylphthalate	0.8160000	0.7206271	0.01	-11.69	50.00	AVRG
3,3'-Dichlorobenzidine	0.4040000	0.4554907	0.01	12.74	50.00	AVRG
bis(2-ethylhexyl)Phthalate	1.1140000	0.9376537	0.01	-15.83	50.00	AVRG
Benzo(a)anthracene	1.3010000	1.2815391	0.01	-1.50	50.00	AVRG
Chrysene	1.1320000	1.0876046	0.01	-3.92	50.00	AVRG
Di-n-octylphthalate	2.4940000	2.2232769	0.01	-10.85	20.00	AVRG
Benzo(b)fluoranthene	1.7900000	1.6120716	0.01	-9.94	50.00	AVRG
Benzo(k)fluoranthene	1.6520000	1.6416396	0.01	-0.63	50.00	AVRG
Benzo(a)pyrene	1.4650000	1.5248229	0.01	4.08	20.00	AVRG
Indeno(1,2,3-cd)pyrene	1.3790000	1.3846820	0.01	0.41	50.00	AVRG
Dibenzo(a,h)anthracene	1.2680000	1.2981113	0.01	2.37	50.00	AVRG
Benzo(g,h,i)perylene	1.3280000	1.2455939	0.01	-6.20	50.00	AVRG
2-Fluorophenol	1.8560000	1.6313114	0.01	-12.11	50.00	AVRG
Phenol-d5	2.0730000	1.8602742	0.01	-10.26	50.00	AVRG
Nitrobenzene-d5	0.5500000	0.5601647	0.01	1.85	50.00	AVRG
2-Fluorobiphenyl	1.4020000	1.3689317	0.01	-2.36	50.00	AVRG
2,4,6-Tribromophenol	0.3040000	0.3760464	0.01	23.70	50.00	AVRG
Terphenyl-d14	0.9590000	0.9543791	0.01	-0.48	50.00	AVRG

ND
VJ,C

POS J,C

FORM VII SV

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID: DF021119A64 DFTPP Injection Date: 11/19/02

Instrument ID: 5972HP64 DFTPP Injection Time: 0928

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	41.3
68	Less than 2.0% of mass 69	0.2 (0.4)1
69	Mass 69 relative abundance	55.9
70	Less than 2.0% of mass 69	0.1 (0.2)1
127	25.0 - 75.0% of mass 198	37.6
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.6
275	10.0 - 30.0% of mass 198	20.3
365	Greater than 0.75% of mass 198	2.82
441	Present, but less than mass 443	10.9
442	40.0 - 110.0% of mass 198	74.5
443	15.0 - 24.0% of mass 442	14.2 (19.1)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD080	SSTD080	HG021119A64	11/19/02	0949
02	40SB11C	Q2788-15	Q2788-15JA64	11/19/02	1318
03					
04					
05					
06					
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22					

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Instrument ID: 5972HP64 Calibration Date: 11/19/02 Time: 0949

Lab File ID: HG021119A64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
N-Nitrosodiphenylamine	0.4340000	0.4662283	0.01	7.42	20.00	AVRG	
4-Bromophenyl-phenylether	0.2290000	0.2574964	0.01	12.44	50.00	AVRG	
Hexachlorobenzene	0.2580000	0.2899720	0.01	12.39	50.00	AVRG	
Atrazine ✓	0.1420000	0.1068013	0.01	-24.79	50.00	AVRG	prev. flagged
Pentachlorophenol	0.1740000	0.1884781	0.05	8.32	20.00	AVRG	
Phenanthrene	1.1440000	1.1481256	0.01	0.36	50.00	AVRG	
Anthracene	1.1700000	1.0954626	0.01	-6.37	50.00	AVRG	
Carbazole	1.0210000	1.1142831	0.01	9.14	50.00	AVRG	
Di-n-butylphthalate	1.6000000	1.5079943	0.01	-5.75	50.00	AVRG	
Fluoranthene	1.2390000	1.2852872	0.01	3.74	20.00	AVRG	
Pyrene	1.4830000	1.4462887	0.01	-2.48	50.00	AVRG	
Butylbenzylphthalate	0.8160000	0.7568422	0.01	-7.25	50.00	AVRG	
3,3'-Dichlorobenzidine ✓	0.4040000	0.5058214	0.01	25.20	50.00	AVRG	ND no flag
bis(2-ethylhexyl)Phthalate	1.1140000	0.9840263	0.01	-11.67	50.00	AVRG	
Benzo(a)anthracene	1.3010000	1.3120192	0.01	0.85	50.00	AVRG	
Chrysene	1.1320000	1.2087054	0.01	6.78	50.00	AVRG	
Di-n-octylphthalate	2.4940000	2.4213762	0.01	-2.91	20.00	AVRG	
Benzo(b)fluoranthene ✓	1.7900000	2.1600734	0.01	20.67	50.00	AVRG	ND no flag
Benzo(k)fluoranthene	1.6520000	1.5835043	0.01	-4.15	50.00	AVRG	
Benzo(a)pyrene	1.4650000	1.5513766	0.01	5.90	20.00	AVRG	
Indeno(1,2,3-cd)pyrene	1.3790000	1.4135096	0.01	2.50	50.00	AVRG	
Dibenzo(a,h)anthracene	1.2680000	1.2319552	0.01	-2.84	50.00	AVRG	
Benzo(g,h,i)perylene	1.3280000	1.2219623	0.01	-7.98	50.00	AVRG	
2-Fluorophenol	1.8560000	1.7396924	0.01	-6.27	50.00	AVRG	
Phenol-d5	2.0730000	2.0548569	0.01	-0.88	50.00	AVRG	
Nitrobenzene-d5	0.5500000	0.5186644	0.01	-5.70	50.00	AVRG	
2-Fluorobiphenyl	1.4020000	1.3258292	0.01	-5.43	50.00	AVRG	
2,4,6-Tribromophenol	0.3040000	0.3217718	0.01	5.84	50.00	AVRG	
Terphenyl-d14	0.9590000	1.0119551	0.01	5.52	50.00	AVRG	

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Lab File ID: DF021124A64 DFTPP Injection Date: 11/24/02

Instrument ID: 5972HP64 DFTPP Injection Time: 0906

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	38.5
68	Less than 2.0% of mass 69	0.2 (0.4)1
69	Mass 69 relative abundance	53.4
70	Less than 2.0% of mass 69	0.2 (0.3)1
127	25.0 - 75.0% of mass 198	37.1
197	Less than 1.0% of mass 198	0.3
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.5
275	10.0 - 30.0% of mass 198	21.5
365	Greater than 0.75% of mass 198	3.09
441	Present, but less than mass 443	12.2
442	40.0 - 110.0% of mass 198	85.6
443	15.0 - 24.0% of mass 442	16.7 (19.5)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD080	SSTD080	HH021124A64	11/24/02	1004
02	SBLKXD	WG21554-1	WG21554-1B64	11/24/02	1038
03	SXDLCS	WG21554-2	WG21554-2B64	11/24/02	1113
04	40SB9F	Q2788-17	Q2788-17RB64	11/24/02	1147
05					
06					
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FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Instrument ID: 5972HP64 Calibration Date: 11/24/02 Time: 1004

Lab File ID: HH021124A64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Benzaldehyde	1.3030000	1.0407916	0.01	-20.12	50.00	AVRG
Phenol	1.8980000	1.5283952	0.01	-19.47	20.00	AVRG
Bis(2-chloroethyl)ether	1.7080000	1.4386814	0.01	-15.77	50.00	AVRG
2-Chlorophenol	1.4280000	1.2725462	0.01	-10.89	50.00	AVRG
2-Methylphenol	1.3840000	1.2806558	0.01	-7.47	50.00	AVRG
2,2'-oxybis(1-Chloropropane)	2.2700000	1.7753430	0.01	-21.79	50.00	AVRG
Acetophenone	2.2450000	2.0525545	0.01	-8.57	50.00	AVRG
4-Methylphenol	1.3170000	1.2494383	0.01	-5.13	50.00	AVRG
N-Nitroso-di-N-propylamine	1.0240000	0.9287707	0.05	-9.30	50.00	AVRG
Hexachloroethane	0.6580000	0.6462952	0.01	-1.78	50.00	AVRG
Nitrobenzene	0.4940000	0.4148159	0.01	-16.03	50.00	AVRG
Isophorone	0.8630000	0.7937310	0.01	-8.03	50.00	AVRG
2-Nitrophenol	0.2290000	0.1973624	0.01	-13.82	20.00	AVRG
2,4-Dimethylphenol	0.2900000	0.2496808	0.01	-13.90	50.00	AVRG
Bis(2-chloroethoxy)methane	0.5180000	0.4899121	0.01	-5.42	50.00	AVRG
2,4-Dichlorophenol	0.3040000	0.2846153	0.01	-6.38	20.00	AVRG
Naphthalene	1.0080000	0.8600104	0.01	-14.68	50.00	AVRG
4-Chloroaniline	0.4920000	0.4758053	0.01	-3.29	50.00	AVRG
Hexachlorobutadiene	0.2120000	0.2469825	0.01	16.50	20.00	AVRG
Caprolactam	0.1610000	0.1226789	0.01	-23.80	50.00	AVRG
4-Chloro-3-methylphenol	0.3430000	0.3291436	0.01	-4.04	20.00	AVRG
2-Methylnaphthalene	0.6690000	0.6228149	0.01	-6.90	50.00	AVRG
Hexachlorocyclopentadiene	0.3970000	0.4628924	0.05	16.60	50.00	AVRG
2,4,6-Trichlorophenol	0.4610000	0.4594959	0.01	-0.33	20.00	AVRG
2,4,5-Trichlorophenol	0.5470000	0.4929789	0.01	-9.88	50.00	AVRG
1,1'-Biphenyl	1.4120000	1.1896268	0.01	-15.75	50.00	AVRG
2-Chloronaphthalene	1.0620000	1.0386817	0.01	-2.20	50.00	AVRG
2-Nitroaniline	0.5440000	0.4675316	0.01	-14.06	50.00	AVRG
Dimethylphthalate	1.5580000	1.2873350	0.01	-17.37	50.00	AVRG
2,6-Dinitrotoluene	0.3520000	0.3840293	0.01	9.10	50.00	AVRG
Acenaphthylene	1.9870000	1.9285291	0.01	-2.94	50.00	AVRG
3-Nitroaniline	0.3770000	0.3849996	0.01	2.12	50.00	AVRG
Acenaphthene	1.1430000	1.1574108	0.01	1.26	20.00	AVRG
2,4-Dinitrophenol	0.2100000	0.2499533	0.05	19.02	50.00	AVRG
4-Nitrophenol	0.2960000	0.3429184	0.05	15.85	50.00	AVRG
2,4-Dinitrotoluene	0.4930000	0.5143696	0.01	4.33	50.00	AVRG
Dibenzofuran	1.7020000	1.5178926	0.01	-10.82	50.00	AVRG
Diethylphthalate	1.4700000	1.5225784	0.01	3.58	50.00	AVRG
4-Chlorophenyl-phenylether	0.6220000	0.6335052	0.01	1.85	50.00	AVRG
Fluorene	1.2220000	1.1302233	0.01	-7.51	50.00	AVRG
4-Nitroaniline	0.4060000	0.3103631	0.01	-23.56	50.00	AVRG
4,6-Dinitro-2-methylphenol	0.1810000	0.2158680	0.01	19.26	50.00	AVRG

ND VJ/C

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Instrument ID: 5972HP64 Calibration Date: 11/24/02 Time: 1004

Lab File ID: HH021124A64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
N-Nitrosodiphenylamine	0.4340000	0.4695440	0.01	8.19	20.00	AVRG	
4-Bromophenyl-phenylether	0.2290000	0.2642604	0.01	15.40	50.00	AVRG	
Hexachlorobenzene	0.2580000	0.3179843	0.01	23.25	50.00	AVRG	
Atrazine	0.1420000	0.0659906	0.01	-53.53	50.00	AVRG	<-FAIL
Pentachlorophenol	0.1740000	0.1851390	0.05	6.40	20.00	AVRG	
Phenanthrene	1.1440000	1.1384417	0.01	-0.48	50.00	AVRG	
Anthracene	1.1700000	1.0963639	0.01	-6.29	50.00	AVRG	
Carbazole	1.0210000	0.8574505	0.01	-16.02	50.00	AVRG	
Di-n-butylphthalate	1.6000000	1.4485764	0.01	-9.46	50.00	AVRG	
Fluoranthene	1.2390000	1.2964041	0.01	4.63	20.00	AVRG	
Pyrene	1.4830000	1.4497060	0.01	-2.24	50.00	AVRG	
Butylbenzylphthalate	0.8160000	0.7812069	0.01	-4.26	50.00	AVRG	
3,3'-Dichlorobenzidine	0.4040000	0.3897065	0.01	-3.54	50.00	AVRG	
bis(2-ethylhexyl)Phthalate	1.1140000	0.9686294	0.01	-13.05	50.00	AVRG	
Benzo(a)anthracene	1.3010000	1.3370029	0.01	2.77	50.00	AVRG	
Chrysene	1.1320000	1.2142170	0.01	7.26	50.00	AVRG	
Di-n-octylphthalate	2.4940000	2.3517168	0.01	-5.70	20.00	AVRG	
Benzo(b)fluoranthene	1.7900000	1.9847581	0.01	10.88	50.00	AVRG	
Benzo(k)fluoranthene	1.6520000	1.5000259	0.01	-9.20	50.00	AVRG	
Benzo(a)pyrene	1.4650000	1.5071371	0.01	2.88	20.00	AVRG	
Indeno(1,2,3-cd)pyrene	1.3790000	1.5448968	0.01	12.03	50.00	AVRG	
Dibenzo(a,h)anthracene	1.2680000	1.3959203	0.01	10.09	50.00	AVRG	
Benzo(g,h,i)perylene	1.3280000	1.3307145	0.01	0.20	50.00	AVRG	
2-Fluorophenol	1.8560000	1.6013907	0.01	-13.72	50.00	AVRG	
Phenol-d5	2.0730000	1.7857063	0.01	-13.86	50.00	AVRG	
Nitrobenzene-d5	0.5500000	0.5013636	0.01	-8.84	50.00	AVRG	
2-Fluorobiphenyl	1.4020000	1.2678104	0.01	-9.57	50.00	AVRG	
2,4,6-Tribromophenol	0.3040000	0.3796176	0.01	24.87	50.00	AVRG	
Terphenyl-d14	0.9590000	1.0886187	0.01	13.52	50.00	AVRG	

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - Sample No.: 40SB9C Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Benzaldehyde	3500	0.00	1200	34	10-101
Phenol	3500	0.00	4700	130*	35-121
Bis(2-chloroethyl)ether	3500	0.00	2700	77	22-116
2-Chlorophenol	3500	0.00	4600	130*	36-116
2-Methylphenol	3500	0.00	3400	97	40-109
2,2'-oxybis(1-Chloropro	3500	0.00	3200	91	28-106
Acetophenone	3500	0.00	3100	89	22-107
4-Methylphenol	6900	0.00	6400	93	10-150
N-Nitroso-di-N-prop.(1)	3500	0.00	3800	110	33-117
Hexachloroethane	3500	0.00	2400	69	12-115
Nitrobenzene	3500	0.00	2800	80	28-117
Isophorone	3500	0.00	2700	77	31-111
2-Nitrophenol	3500	0.00	3800	110	36-117
2,4-Dimethylphenol	3500	0.00	4700	130	26-133
Bis(2-chloroethoxy)meth	3500	0.00	3400	97	44-125
2,4-Dichlorophenol	3500	0.00	4400	130*	41-123
Naphthalene	3500	0.00	3000	86	19-112
4-Chloroaniline	3500	0.00	3000	86	10-100
Hexachlorobutadiene	3500	0.00	3000	86	22-122
Caprolactam	3500	0.00	2700	77	10-150
4-Chloro-3-methylphenol	3500	0.00	4900	140*	39-121
2-Methylnaphthalene	3500	0.00	3000	86	20-146
Hexachlorocyclopentadie	3500	0.00	1400	40	10-150
2,4,6-Trichlorophenol	3500	0.00	4200	120	40-137
2,4,5-Trichlorophenol	3500	0.00	3000	86	45-127
1,1'-Biphenyl	3500	0.00	2600	74	30-109
2-Chloronaphthalene	3500	0.00	2800	80	23-131
2-Nitroaniline	3500	0.00	3100	89	22-140

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - Sample No.: 40SB9C Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzaldehyde	3500	660	19	58*	50	10-101
Phenol	3500	4000	110	16	47	35-121
Bis(2-chloroethyl)ether	3500	2500	71	8	50	22-116
2-Chlorophenol	3500	4100	120*	11	43	36-116
2-Methylphenol	3500	3000	86	12	45	40-109
2,2'-oxybis(1-Chloropro	3500	2800	80	13	46	28-106
Acetophenone	3500	2500	71	21	43	22-107
4-Methylphenol	6900	5200	75	21	40	10-150
N-Nitroso-di-N-prop.(1)	3500	3400	97	11	45	33-117
Hexachloroethane	3500	2100	60	13	50	12-115
Nitrobenzene	3500	2400	69	15	43	28-117
Isophorone	3500	2800	80	4	42	31-111
2-Nitrophenol	3500	3800	110	0	48	36-117
2,4-Dimethylphenol	3500	4600	130	2	43	26-133
Bis(2-chloroethoxy)meth	3500	3100	89	9	43	44-125
2,4-Dichlorophenol	3500	4300	120	2	45	41-123
Naphthalene	3500	2600	74	14	37	19-112
4-Chloroaniline	3500	2500	71	18	50	10-100
Hexachlorobutadiene	3500	3200	91	6	46	22-122
Caprolactam	3500	2500	71	8	50	10-150
4-Chloro-3-methylphenol	3500	4800	140*	2	45	39-121
2-Methylnaphthalene	3500	3000	86	0	32	20-146
Hexachlorocyclopentadie	3500	1200	34	15	50	10-150
2,4,6-Trichlorophenol	3500	3400	97	21	44	40-137
2,4,5-Trichlorophenol	3500	2600	74	14	43	45-127
1,1'-Biphenyl	3500	2600	74	0	43	30-109
2-Chloronaphthalene	3500	2600	74	7	41	23-131
2-Nitroaniline	3500	2800	80	10	40	22-140

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - Sample No.: 40SB9C Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dimethylphthalate	3500	2300	66	23	45	33-123
2,6-Dinitrotoluene	3500	3000	86	3	42	20-138
Acenaphthylene	3500	2800	80	7	40	29-118
3-Nitroaniline	3500	3000	86	0	43	17-100
Acenaphthene	3500	2700	77	17	41	20-109
2,4-Dinitrophenol	3500	700	20	60*	50	10-142
4-Nitrophenol	3500	2600	74	11	42	10-150
2,4-Dinitrotoluene	3500	2900	83	4	43	24-128
Dibenzofuran	3500	2800	80	16	35	40-118
Diethylphthalate	3500	3100	89	0	41	32-119
4-Chlorophenyl-phenylet	3500	2600	74	18	42	34-118
Fluorene	3500	3100	89	0	32	23-119
4-Nitroaniline	3500	3200	91	9	45	16-106
4,6-Dinitro-2-methylphe	3500	1400	40	44	50	10-126
N-Nitrosodiphenylamine	3500	3400	97	6	37	31-125
4-Bromophenyl-phenyleth	3500	3200	91	12	45	38-119
Hexachlorobenzene	3500	3100	89	12	44	31-133
Atrazine	3500	4100	120	18	50	10-150
Pentachlorophenol	3500	4100	120	16	50	10-150
Phenanthrene	3500	3100	89	12	50	31-113
Anthracene	3500	2900	83	13	39	29-114
Carbazole	3500	3200	91	12	43	36-131
Di-n-butylphthalate	3500	2800	80	13	50	17-132
Fluoranthene	3500	3200	91	12	50	26-124
Pyrene	3500	3000	86	10	50	13-125
Butylbenzylphthalate	3500	2700	77	14	43	28-118
3,3'-Dichlorobenzidine	3500	2600	74	7	50	10-106
bis(2-ethylhexyl)Phthal	3500	2600	74	14	50	13-133

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

3D
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

STULCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Benzaldehyde	2667	763.5	29	10-100
Phenol	2667	3795	142*	23-134
Bis(2-chloroethyl)ether	2667	2680	100	19-113
2-Chlorophenol	2667	3904	146*	20-133
2-Methylphenol	2667	2601	98	21-125
2,2'-oxybis(1-Chloropro	2667	2487	93	18-114
Acetophenone	2667	2432	91	15-110
4-Methylphenol	5333	4708	88	10-100
N-Nitroso-di-N-prop.(1)	2667	2847	107	12-140
Hexachloroethane	2667	2175	82	10-131
Nitrobenzene	2667	2416	90	18-127
Isophorone	2667	2510	94	21-117
2-Nitrophenol	2667	3823	143*	20-128
2,4-Dimethylphenol	2667	3938	148*	10-133
Bis(2-chloroethoxy)meth	2667	2924	110	22-141
2,4-Dichlorophenol	2667	3796	142*	20-137
Naphthalene	2667	2564	96	14-113
4-Chloroaniline	2667	2203	83	10-107
Hexachlorobutadiene	2667	2822	106	11-137
Caprolactam	2667	2249	84	13-111
4-Chloro-3-methylphenol	2667	3722	140*	19-137
2-Methylnaphthalene	2667	2587	97	16-146
Hexachlorocyclopentadie	2667	2606	98	10-150
2,4,6-Trichlorophenol	2667	3994	150*	21-148
2,4,5-Trichlorophenol	2667	2506	94	20-147
1,1'-Biphenyl	2667	2361	88	20-115
2-Chloronaphthalene	2667	2505	94	15-138
2-Nitroaniline	2667	2859	107	20-132

(1) N-Nitroso-di-n-propylamine
Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

3D
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

STULCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Dimethylphthalate	2667	2572	96	20-129
2,6-Dinitrotoluene	2667	2603	98	18-131
Acenaphthylene	2667	2833	106	18-121
3-Nitroaniline	2667	2456	92	11-105
Acenaphthene	2667	2817	106	18-112
2,4-Dinitrophenol	2667	3676	138	10-150
4-Nitrophenol	2667	3120	117	10-145
2,4-Dinitrotoluene	2667	2244	84	18-128
Dibenzofuran	2667	2638	99	24-131
Diethylphthalate	2667	2803	105	18-128
4-Chlorophenyl-phenylet	2667	2429	91	18-130
Fluorene	2667	2545	95	15-123
4-Nitroaniline	2667	3089	116*	10-113
4,6-Dinitro-2-methylphe	2667	3051	114	10-150
N-Nitrosodiphenylamine	2667	2914	109	23-123
4-Bromophenyl-phenyleth	2667	2817	106	21-131
Hexachlorobenzene	2667	2782	104	15-148
Atrazine	2667	3989	150	10-150
Pentachlorophenol	2667	4704	176*	10-150
Phenanthrene	2667	2786	104	18-123
Anthracene	2667	2733	102	19-120
Carbazole	2667	3003	112	24-140
Di-n-butylphthalate	2667	2737	103	20-131
Fluoranthene	2667	2870	108	16-127
Pyrene	2667	2590	97	12-123
Butylbenzylphthalate	2667	2613	98	20-119
3,3'-Dichlorobenzidine	2667	1947	73	10-129
bis(2-ethylhexyl)Phthal	2667	2639	99	18-125

(1) N-Nitroso-di-n-propylamine
Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

3D
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

SURLCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Benzaldehyde	2667	2125	80	10-100
Phenol	2667	3422	128	23-134
Bis(2-chloroethyl)ether	2667	2116	79	19-113
2-Chlorophenol	2667	3255	122	20-133
2-Methylphenol	2667	2503	94	21-125
2,2'-oxybis(1-Chloropro	2667	2391	90	18-114
Acetophenone	2667	1983	74	15-110
4-Methylphenol	5333	4248	80	10-100
N-Nitroso-di-N-prop.(1)	2667	2688	101	12-140
Hexachloroethane	2667	1720	64	10-131
Nitrobenzene	2667	2185	82	18-127
Isophorone	2667	2476	93	21-117
2-Nitrophenol	2667	3606	135*	20-128
2,4-Dimethylphenol	2667	4229	158*	10-133
Bis(2-chloroethoxy)meth	2667	2682	100	22-141
2,4-Dichlorophenol	2667	3834	144*	20-137
Naphthalene	2667	2393	90	14-113
4-Chloroaniline	2667	2174	82	10-107
Hexachlorobutadiene	2667	2750	103	11-137
Caprolactam	2667	2196	82	13-111
4-Chloro-3-methylphenol	2667	4255	160*	19-137
2-Methylnaphthalene	2667	2640	99	16-146
Hexachlorocyclopentadie	2667	1912	72	10-150
2,4,6-Trichlorophenol	2667	3574	134	21-148
2,4,5-Trichlorophenol	2667	2464	92	20-147
1,1'-Biphenyl	2667	2285	86	20-115
2-Chloronaphthalene	2667	2173	81	15-138
2-Nitroaniline	2667	2457	92	20-132

(1) N-Nitroso-di-n-propylamine
Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

SOIL SEMIVOLATILE LAB CONTROL SAMPLE

SURLCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Dimethylphthalate	2667	2002	75	20-129
2,6-Dinitrotoluene	2667	2797	105	18-131
Acenaphthylene	2667	2337	88	18-121
3-Nitroaniline	2667	2779	104	11-105
Acenaphthene	2667	2369	89	18-112
2,4-Dinitrophenol	2667	2611	98	10-150
4-Nitrophenol	2667	2665	100	10-145
2,4-Dinitrotoluene	2667	2676	100	18-128
Dibenzofuran	2667	2470	93	24-131
Diethylphthalate	2667	2780	104	18-128
4-Chlorophenyl-phenylet	2667	2358	88	18-130
Fluorene	2667	2727	102	15-123
4-Nitroaniline	2667	2734	102	10-113
4,6-Dinitro-2-methylphe	2667	2735	102	10-150
N-Nitrosodiphenylamine	2667	3002	112	23-123
4-Bromophenyl-phenyleth	2667	2687	101	21-131
Hexachlorobenzene	2667	2794	105	15-148
Atrazine	2667	3655	137	10-150
Pentachlorophenol	2667	4599	172*	10-150
Phenanthrene	2667	2718	102	18-123
Anthracene	2667	2554	96	19-120
Carbazole	2667	2864	107	24-140
Di-n-butylphthalate	2667	2480	93	20-131
Fluoranthene	2667	2860	107	16-127
Pyrene	2667	2602	98	12-123
Butylbenzylphthalate	2667	2399	90	20-119
3,3'-Dichlorobenzidine	2667	2620	98	10-129
bis(2-ethylhexyl)Phthal	2667	2405	90	18-125

(1) N-Nitroso-di-n-propylamine
Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

DATA VALIDATION WORKSHEET

Explosives

Reviewer: AJ
Date: 01/29/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: Q2788
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	X		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: samples from COC 1014: 40SB88A, 40SB8F received too cold (1.1°C)
No action taken on this.

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes:
sampled 11/12/02, 11/13/02, 11/11/02
extracted 11/14/02, 11/18/02
analysis 11/20/02, 11/21/02
Cooler with samples 40SB88A, 40SB8F too cold (1.1°C) - No action taken.

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			X

Notes: No field /equipment blanks in this data package.

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		X	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).		X	
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes: CCAL 028 NFULL45W - 1,3-DNB %D 17.06, 2,4,6-TNB 16.04 - No action taken, all ND.
CCAL 052 NFULL45Y - 1,3-DNB %D 16.04 - No action taken, all ND. CCAL 060 NFULL45Z
2,4,6-TNB %D - 19.32, 4-Nitrotoluene - No action taken since its the last calibration in the batch & no samples follow it.

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	X		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS/MSD sample 405896C MS %R Nitrobenzene = 43% MSD %R Nitrobenzene = 3
RPD RDX = 44%
Since all sample results were ND, No action was taken.

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: NO LCSD.

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.	X		

Notes: D-1 is field Dup

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: Ø			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100 %			
	% Completeness = 100 %			

Notes:

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN74 Calibration Date: 11/20/02 Time: 1155

Lab File ID: 028NFULL4SW Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1257.6320	1257.6320	0.01	-4.70	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	3848.0640	3848.0640	0.01	5.44	15.00	AVRG	
RDX	31.457742	31.250000	1608.9920	0.01	-0.66		LINR	
1,3-Dinitrobenzene	4880.9730	5713.4720	5713.4720	0.01	17.06	15.00	AVRG	<-
2,4,6-Trinitrotoluene	2567.0750	2978.7840	2978.7840	0.01	16.04	15.00	AVRG	<-
Tetryl	3844.6050	3455.3760	3455.3760	0.01	-10.12	15.00	AVRG	
Nitrobenzene	7689.2100	6910.7520	6910.7520	0.01	-10.12	15.00	AVRG	
2,4-Dinitrotoluene	3994.7010	4048.8960	4048.8960	0.01	1.36	15.00	AVRG	
2,6-Dinitrotoluene	2601.4990	2719.2480	2719.2480	0.01	4.53	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3188.0800	3188.0800	0.01	-2.40	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	51.694324	62.500000	2497.2160	0.01	17.29		LINR	
2-Nitrotoluene	1987.5310	1911.3600	1911.3600	0.01	-3.83	15.00	AVRG	
4-Nitrotoluene	1448.9760	1537.9200	1537.9200	0.01	6.14	15.00	AVRG	
3-Nitrotoluene	1945.6140	1987.5840	1987.5840	0.01	2.16	15.00	AVRG	
1,4-Dinitrobenzene	3915.6410	3985.1280	3985.1280	0.01	1.77	15.00	AVRG	

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN74 Calibration Date: 11/21/02 Time: 0714

Lab File ID: 052NFULL4SY Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1193.1200	1193.1200	0.01	-9.59	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	3691.3600	3691.3600	0.01	1.14	15.00	AVRG	
RDX	32.105656	31.250000	1639.6480	0.01	-2.74		LINR	
1,3-Dinitrobenzene	4880.9730	5663.6800	5663.6800	0.01	16.04	15.00	AVRG	<-
2,4,6-Trinitrotoluene	2567.0750	2473.5360	2473.5360	0.01	-3.64	15.00	AVRG	
Tetryl	3844.6050	3285.2320	3285.2320	0.01	-14.55	15.00	AVRG	
Nitrobenzene	7689.2100	6570.4640	6570.4640	0.01	-14.55	15.00	AVRG	
2,4-Dinitrotoluene	3994.7010	4325.7920	4325.7920	0.01	8.29	15.00	AVRG	
2,6-Dinitrotoluene	2601.4990	2549.9680	2549.9680	0.01	-1.98	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3210.3200	3210.3200	0.01	-1.71	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	50.601547	62.500000	2437.2160	0.01	19.04		LINR	
2-Nitrotoluene	1987.5310	1854.8960	1854.8960	0.01	-6.67	15.00	AVRG	
4-Nitrotoluene	1448.9760	1590.8000	1590.8000	0.01	9.79	15.00	AVRG	
3-Nitrotoluene	1945.6140	1983.9840	1983.9840	0.01	1.97	15.00	AVRG	
1,4-Dinitrobenzene	3915.6410	3798.5840	3798.5840	0.01	-2.99	15.00	AVRG	

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN74 Calibration Date: 11/21/02 Time: 1439

Lab File ID: 060NFULL4SZ Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1248.2240	1248.2240	0.01	-5.41	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	3736.8000	3736.8000	0.01	2.39	15.00	AVRG	
RDX	32.595987	31.250000	1662.8480	0.01	-4.31		LINR	
1,3-Dinitrobenzene	4880.9730	5129.6320	5129.6320	0.01	-5.09	15.00	AVRG	
2,4,6-Trinitrotoluene	2567.0750	2071.2000	2071.2000	0.01	-19.32	15.00	AVRG	<-
Tetryl	3844.6050	3616.8480	3616.8480	0.01	-5.92	15.00	AVRG	
Nitrobenzene	7689.2100	7233.6960	7233.6960	0.01	-5.92	15.00	AVRG	
2,4-Dinitrotoluene	3994.7010	4282.9120	4282.9120	0.01	7.21	15.00	AVRG	
2,6-Dinitrotoluene	2601.4990	2475.5040	2475.5040	0.01	-4.84	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3407.9520	3407.9520	0.01	4.34	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	50.021647	62.500000	2405.3760	0.01	19.96		LINR	
2-Nitrotoluene	1987.5310	2060.8000	2060.8000	0.01	-3.69	15.00	AVRG	
4-Nitrotoluene	1448.9760	1720.1120	1720.1120	0.01	-18.71	15.00	AVRG	<-
3-Nitrotoluene	1945.6140	2191.1200	2191.1200	0.01	-12.62	15.00	AVRG	
1,4-Dinitrobenzene	3915.6410	4122.1920	4122.1920	0.01	5.28	15.00	AVRG	

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - EPA Sample No.: 40SB9C

COMPOUND	SPIKE ADDED (mg/Kg	SAMPLE CONCENTRATION (mg/Kg)	MS CONCENTRATION (mg/Kg)	MS % REC #	QC. LIMITS REC.
HMX	3.0	0.0	2.2	73	50-150
1,3,5-Trinitrobenzene	2.0	0.0	2.0	100	50-150
RDX	2.0	0.0	2.5	125	50-150
1,3-Dinitrobenzene	2.0	0.0	2.2	110	50-150
2,4,6-Trinitrotoluene	2.0	0.0	1.6	80	50-150
Tetryl	3.0	0.0	1.7	57	50-150
Nitrobenzene	2.0	0.0	0.86	43*	50-150
2,4-Dinitrotoluene	2.0	0.0	1.9	95	50-150
2,6-Dinitrotoluene	3.0	0.0	3.1	103	50-150
2-Amino-4,6-dinitrotolu	3.0	0.0	2.6	87	50-150
4-Amino-2,6-dinitrotolu	3.0	0.0	4.5	150	50-150
2-Nitrotoluene	3.0	0.0	2.5	83	50-150
4-Nitrotoluene	3.0	0.0	2.6	87	50-150
3-Nitrotoluene	3.0	0.0	2.6	87	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - EPA Sample No.: 40SB9C

COMPOUND	SPIKE ADDED (mg/Kg	MSD CONCENTRATION (mg/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	3.0	2.8	93	24	30	50-150
1,3,5-Trinitrobenzene	2.0	1.5	75	28	30	50-150
RDX	2.0	1.6	80	44*	30	50-150
1,3-Dinitrobenzene	2.0	2.0	100	10	30	50-150
2,4,6-Trinitrotoluene	2.0	1.6	80	0	30	50-150
Tetryl	3.0	1.6	53	6	30	50-150
Nitrobenzene	2.0	0.78	39*	10	30	50-150
2,4-Dinitrotoluene	2.0	2.0	100	5	30	50-150
2,6-Dinitrotoluene	3.0	2.6	87	18	30	50-150
2-Amino-4,6-dinitrotolu	3.0	2.4	80	8	30	50-150
4-Amino-2,6-dinitrotolu	3.0	4.4	147	2	30	50-150
2-Nitrotoluene	3.0	2.7	90	8	30	50-150
4-Nitrotoluene	3.0	2.8	93	7	30	50-150
3-Nitrotoluene	3.0	2.3	77	12	30	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 1 out of 14 outside limits
Spike Recovery: 2 out of 28 outside limits

COMMENTS: _____

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RA
Date: 1/23/03
DV Level: II (III) IV
Review Document:

_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: 02788
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

collected	extracted	analyzed	
11/12/02	11/16/02	11/18/02	11/12/02
11/11/02	11/13/02	11/14/02	11/15/02
11/13/02	11/16/02	11/22/02	11/21/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: EBs in R2788 all ND ✓

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.			

Notes: see attached

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: 3ur p-terphenyl 2117 50-150 in 40551 POS K/S
QC in 40554, 40552, 405B11F, 405B9F, 405B8F POS K/S

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: Chrysene -953/-930% MS/MSD J/m in LCSD/MC
acenaphthene RPD 60%. ~~Comment only~~

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes: See attached

J/J unless prev flagged

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			
	% Completeness = _____			

Notes:

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN76 Calibration Date: 11/15/02 Time: 1252

Lab File ID: 057PPNA4NE Init. Calib. Date(s): 11/08/02 11/08/02

Init. Calib. Times: 1714 1938

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1244.8370	1380.7360	0.1	10.92	15.00	AVRG	
Acenaphthene	756.34100	802.75200	0.01	6.14	15.00	AVRG	
Fluorene	5088.0190	5336.7360	0.01	4.89	15.00	AVRG	
Pyrene	5033.0920	5595.2000	0.01	11.17	15.00	AVRG	
Phenanthrene	11511.222	13302.288	0.01	15.56	15.00	AVRG	<-
Anthracene	19458.056	19855.008	0.01	2.04	15.00	AVRG	
Fluoranthene	3714.6320	4392.8000	0.01	18.26	15.00	AVRG	<-
Chrysene	12841.320	13860.240	0.01	7.93	15.00	AVRG	
Benzo(b)fluoranthene	8807.1200	9493.8400	0.01	7.80	15.00	AVRG	
Benzo(k)fluoranthene	6619.4560	7118.3200	0.01	7.54	15.00	AVRG	
Dibenzo(a,h)anthracene	2626.4240	2724.0800	0.01	3.72	15.00	AVRG	
Benzo(g,h,i)perylene	3345.2320	3394.2400	0.01	1.46	15.00	AVRG	
Benzo(a)anthracene	7967.8640	8583.8400	0.01	7.73	15.00	AVRG	
Benzo(a)pyrene	8522.0240	8895.6800	0.01	4.38	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	6969.4000	7463.6800	0.01	7.09	15.00	AVRG	
Acenaphthylene	1003.3660	1080.5120	0.01	7.69	15.00	AVRG	
p-Terphenyl	3786.9580	4039.9200	0.01	6.68	15.00	AVRG	

pos J, C

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN76 Calibration Date: 11/18/02 Time: 1117

Lab File ID: 059PPNA4NF Init. Calib. Date(s): 11/08/02 11/08/02

Init. Calib. Times: 1714 1938

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1244.8370	1369.6640	0.1	10.03	15.00	AVRG	
Acenaphthene	756.34100	788.22400	0.01	4.22	15.00	AVRG	
Fluorene	5088.0190	5325.3920	0.01	4.66	15.00	AVRG	
Pyrene	5033.0920	5746.0400	0.01	14.16	15.00	AVRG	
Phenanthrene	11511.222	12116.560	0.01	5.26	15.00	AVRG	
Anthracene	19458.056	19677.328	0.01	1.13	15.00	AVRG	
Fluoranthene	3714.6320	4077.9600	0.01	9.78	15.00	AVRG	
Chrysene	12841.320	14012.880	0.01	9.12	15.00	AVRG	
Benzo(b)fluoranthene	8807.1200	9957.6800	0.01	13.06	15.00	AVRG	
Benzo(k)fluoranthene	6619.4560	7327.2800	0.01	10.69	15.00	AVRG	
Dibenzo(a,h)anthracene	2626.4240	2855.3600	0.01	8.72	15.00	AVRG	
Benzo(g,h,i)perylene	3345.2320	3697.8400	0.01	10.54	15.00	AVRG	
Benzo(a)anthracene	7967.8640	8735.2800	0.01	9.63	15.00	AVRG	
Benzo(a)pyrene	8522.0240	9322.8800	0.01	9.40	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	6969.4000	7763.3600	0.01	11.39	15.00	AVRG	
Acenaphthylene	1003.3660	1165.6480	0.01	16.17	15.00	AVRG	<-
p-Terphenyl	3786.9580	4101.1040	0.01	8.30	15.00	AVRG	

Pos J/C

FORM VII 8310

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN76 Calibration Date: 11/19/02 Time: 0426

Lab File ID: 085PPNA4NH Init. Calib. Date(s): 11/08/02 11/08/02

Init. Calib. Times: 1714 1938

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1244.8370	1431.5200	0.1	15.00	15.00	AVRG	
Acenaphthene	756.34100	834.64000	0.01	10.35	15.00	AVRG	
Fluorene	5088.0190	5558.1760	0.01	9.24	15.00	AVRG	
Pyrene ✓	5033.0920	5862.7200	0.01	16.48	15.00	AVRG	<-
Phenanthrene	11511.222	12600.208	0.01	9.46	15.00	AVRG	
Anthracene	19458.056	20121.520	0.01	3.41	15.00	AVRG	
Fluoranthene	3714.6320	4269.4000	0.01	14.93	15.00	AVRG	
Chrysene	12841.320	14349.360	0.01	11.74	15.00	AVRG	
Benzo(b)fluoranthene ✓	8807.1200	10158.160	0.01	15.34	15.00	AVRG	<-
Benzo(k)fluoranthene	6619.4560	7431.6800	0.01	12.27	15.00	AVRG	
Dibenzo(a,h)anthracene	2626.4240	2899.4400	0.01	10.39	15.00	AVRG	
Benzo(g,h,i)perylene	3345.2320	3748.2400	0.01	12.05	15.00	AVRG	
Benzo(a)anthracene	7967.8640	8924.4000	0.01	12.00	15.00	AVRG	
Benzo(a)pyrene	8522.0240	9338.8000	0.01	9.58	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	6969.4000	7836.5600	0.01	12.44	15.00	AVRG	
Acenaphthylene ✓	1003.3660	1190.3200	0.01	18.63	15.00	AVRG	<-
p-Terphenyl	3786.9580	4218.7520	0.01	11.40	15.00	AVRG	

pos JC

FORM VII 8310

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN76 Calibration Date: 11/21/02 Time: 0059

Lab File ID: 008QPNA4NO Init. Calib. Date(s): 11/20/02 11/20/02

Init. Calib. Times: 2112 2347

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1391.3310	1497.0240	0.1	7.60	15.00	AVRG	
Acenaphthene	753.13900	821.76000	0.01	9.11	15.00	AVRG	
Fluorene	5095.9310	5956.4160	0.01	16.88	15.00	AVRG	<-
Pyrene	6010.3720	5783.6800	0.01	-3.77	15.00	AVRG	
Phenanthrene	11499.560	12788.384	0.01	11.21	15.00	AVRG	
Anthracene	19419.770	20597.792	0.01	6.07	15.00	AVRG	
Fluoranthene	3925.7720	4162.5200	0.01	6.03	15.00	AVRG	
Chrysene	13266.832	14803.600	0.01	11.58	15.00	AVRG	
Benzo(b)fluoranthene	10085.864	10428.960	0.01	3.40	15.00	AVRG	
Benzo(k)fluoranthene	6798.3840	7589.3600	0.01	11.63	15.00	AVRG	
Dibenzo(a,h)anthracene	2666.3680	2968.2400	0.01	11.32	15.00	AVRG	
Benzo(g,h,i)perylene	3277.7520	3782.2400	0.01	15.39	15.00	AVRG	<-
Benzo(a)anthracene	8221.2640	9156.2400	0.01	11.37	15.00	AVRG	
Benzo(a)pyrene	8721.4000	9515.3600	0.01	9.10	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7194.0080	7974.4000	0.01	10.85	15.00	AVRG	
Acenaphthylene	1059.2480	1208.4480	0.01	14.08	15.00	AVRG	
p-Terphenyl	3948.3150	4319.6160	0.01	9.40	15.00	AVRG	

all ND
no FID

FORM VII 8310

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN76 Calibration Date: 11/21/02 Time: 0735

Lab File ID: 019QPNA4NP Init. Calib. Date(s): 11/20/02 11/20/02

Init. Calib. Times: 2112 2347

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1391.3310	1421.9840	0.1	2.20	15.00	AVRG	
Acenaphthene	753.13900	843.05600	0.01	11.94	15.00	AVRG	
Fluorene	5095.9310	5725.1680	0.01	12.35	15.00	AVRG	
Pyrene	6010.3720	5993.1200	0.01	-0.29	15.00	AVRG	
Phenanthrene	11499.560	12685.648	0.01	10.31	15.00	AVRG	
Anthracene	19419.770	20421.024	0.01	5.16	15.00	AVRG	
Fluoranthene	3925.7720	4265.5600	0.01	8.66	15.00	AVRG	
Chrysene	13266.832	15043.920	0.01	13.39	15.00	AVRG	
Benzo(b)fluoranthene	10085.864	10557.360	0.01	4.67	15.00	AVRG	
Benzo(k)fluoranthene	6798.3840	7748.0000	0.01	13.97	15.00	AVRG	
Dibenzo(a,h)anthracene	2666.3680	2977.2800	0.01	11.66	15.00	AVRG	
Benzo(g,h,i)perylene	3277.7520	3870.4000	0.01	18.08	15.00	AVRG	<-
Benzo(a)anthracene	8221.2640	9372.0000	0.01	14.00	15.00	AVRG	
Benzo(a)pyrene	8721.4000	9719.4400	0.01	11.44	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7194.0080	8056.8800	0.01	11.99	15.00	AVRG	
Acenaphthylene	1059.2480	1222.2240	0.01	15.39	15.00	AVRG	<-
p-Terphenyl	3948.3150	4433.6000	0.01	12.29	15.00	AVRG	

FORM VII 8310

2F

SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

GC Column(1): LC-PAH ID: 4.60 (mm) GC Column(2): PAH-C16 ID: 4.60 (mm)

	EPA SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	S3 1 %REC #	S3 2 %REC #	TOT OUT
01	PBLKTW	79	72					0
02	40SB12A	71	62					0
03	PTWLCS	85						0
04	40SB12B	79						0
05	40SB12C	54	52					0
06	71SB11	77	78					0
07	71SS12	52	52					0
08	40SS5	86	106					0
09	71SS11	89	72					0
10	40SS3	69	132					0
11	40SS1	110	211*					1
12	D-1	99	132					0
13	40SS4	500 D	114					0
14	40SS2	640 D	177D					0
15	PBLKUO	98	83					0
16	PLCSUO	93						0
17	40SB9CMS	88						0
18	40SB9CMSD	93						0
19	40SB11B	78	79					0
20	40SB11C	92	76					0
21	40SB9A	120	56					0
22	40SB9C	82	90					0
23	40SB8A	150	126					0
24	40SB11F	230 D	95					0
25	40SB9F	200 D	1138D					0
26	40SB8F	63	171D					0
27								
28								
29								
30								

ADVISORY QC LIMITS

S1 = p-Terphenyl (50-150)

\# Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - EPA Sample No.: 40SB9C

COMPOUND	SPIKE ADDED (ug/Kg	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Naphthalene	170	0.0	160	94	50-150
Acenaphthene	170	55	280	132	50-150
Fluorene	350	0.0	280	80	50-150
Pyrene	86	51	100	57	50-150
Phenanthrene	170	0.0	160	94	50-150
Anthracene	170	0.0	160	94	50-150
Fluoranthene	86	0.0	80	93	50-150
Chrysene	86	1300	480	-953*	50-150
Benzo(b)fluoranthene	43	3.4	44	94	50-150
Benzo(k)fluoranthene	43	0.0	42	98	50-150
Dibenzo(a,h)anthracene	43	0.0	43	100	50-150
Benzo(g,h,i)perylene	43	0.0	43	100	50-150
Benzo(a)anthracene	43	0.0	43	100	50-150
Benzo(a)pyrene	43	0.0	41	95	50-150
Indeno(1,2,3-cd)pyrene	43	0.0	42	98	50-150
Acenaphthylene	170	0.0	140	82	20-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Matrix Spike - EPA Sample No.: 40SB9C

COMPOUND	SPIKE ADDED (ug/Kg	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Naphthalene	170	160	94	0	20	50-150
Acenaphthene	170	150	56	60*	20	50-150
Fluorene	350	270	77	4	20	50-150
Pyrene	86	110	69	10	20	50-150
Phenanthrene	170	160	94	0	20	50-150
Anthracene	170	160	94	0	20	50-150
Fluoranthene	86	93	108	15	20	50-150
Chrysene	86	500	-930*	4	20	50-150
Benzo(b)fluoranthene	43	48	104	9	20	50-150
Benzo(k)fluoranthene	43	47	109	11	20	50-150
Dibenzo(a,h)anthracene	43	46	107	7	20	50-150
Benzo(g,h,i)perylene	43	47	109	9	20	50-150
Benzo(a)anthracene	43	50	116	15	20	50-150
Benzo(a)pyrene	43	46	107	11	20	50-150
Indeno(1,2,3-cd)pyrene	43	46	107	9	20	50-150
Acenaphthylene	170	130	76	7	20	20-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 1 out of 16 outside limits
Spike Recovery: 2 out of 32 outside limits

COMMENTS: _____

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-15 Date(s) Analyzed: 11/18/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.76	13.43	14.43	16	
	2	15.06	14.24	15.24	18	11.8
Benzo(b)fluoranthene	1	18.66	18.68	19.68	16	
	2	17.44	17.00	18.00	3.7	124.9
Acenaphthylene	1	8.82	7.80	8.80	12	
	2	12.51	11.51	12.51	10	18.2
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A
PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.
40SB11F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-13 Date(s) Analyzed: 11/21/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.60	13.16	14.16	340	
	2	14.83	14.24	15.24	130	89.4
Fluoranthene	1	12.85	12.37	13.37	160	
	2	14.31	13.73	14.73	280	54.5
Chrysene	1	16.75	16.32	17.32	2200	
	2	16.03	15.52	16.52	46	191.8
Benzo(a)pyrene	1	20.68	20.15	21.15	45	
	2	18.14	17.64	18.64	20	76.9
Acenaphthylene	1	8.42	7.60	8.60	1300	
	2	12.16	11.51	12.51	13	196.0
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

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PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB12A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-1 Date(s) Analyzed: 11/14/02 11/23/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.45	13.43	14.43	12	
	2	14.74	14.24	15.24	7.5	46.2
Fluoranthene	1	12.86	12.64	13.64	13	
	2	14.19	13.73	14.73	39	100.0
Benzo(k)fluoranthene	1	20.01	19.79	20.79	110	
	2	17.52	17.12	18.12	1.6	194.3
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

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PESTICIDE IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-19 Date(s) Analyzed: 11/18/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.64	6.75	7.75	78	
	2	9.65	9.38	10.38	50	43.8
Pyrene	1	13.86	13.43	14.43	67	
	2	14.74	14.24	15.24	33	68.0
Phenanthrene	1	11.16	10.62	11.62	12	
	2	12.90	12.35	13.35	14	15.4
Fluoranthene	1	13.08	12.64	13.64	70	
	2	14.23	13.73	14.73	84	18.2
Chrysene	1	16.89	16.75	17.75	140	
	2	15.97	15.52	16.52	19	152.2
Benzo(b)fluoranthene	1	18.71	18.68	19.68	28	
	2	17.46	17.00	18.00	31	10.2
Benzo(k)fluoranthene	1	19.73	19.79	20.79	11	
	2	17.59	17.12	18.12	29	90.0
Benzo(a)anthracene	1	16.25	16.00	17.00	28	
	2	15.97	15.52	16.52	19	38.3

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PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-19 Date(s) Analyzed: 11/18/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(a)pyrene	1	20.62	20.75	21.75	14	
	2	18.08	17.64	18.64	12	15.4
Indeno(1,2,3-cd)pyrene	1	23.98	24.69	25.69	10	
	2	19.21	19.09	20.09	180	178.9
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

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PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-20 Date(s) Analyzed: 11/22/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.47	6.56	7.56	69	
	2	9.66	9.38	10.38	36	62.8
Acenaphthene	1	9.51	8.99	9.99	7000	
	2	11.12	10.36	11.36	21	198.8
Pyrene	1	13.78	13.16	14.16	110	
	2	14.76	14.24	15.24	20	138.5
Phenanthrene	1	10.94	10.38	11.38	36	
	2	12.90	12.35	13.35	13	93.9
Fluoranthene	1	12.96	12.37	13.37	57	
	2	14.20	13.73	14.73	89	43.8
Benzo(b)fluoranthene	1	18.89	18.16	19.16	15	
	2	17.24	17.00	18.00	660	191.1
Dibenzo(a,h)anthracene	1	22.66	21.56	22.56	54	
	2	18.58	18.22	19.22	220	121.2
Benzo(a)pyrene	1	21.15	20.15	21.15	100	
	2	18.02	17.64	18.64	130	26.1

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PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-20 Date(s) Analyzed: 11/22/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.55	8.99	9.99	6400	
	2	11.12	10.36	11.36	21	198.7
Pyrene	1	13.64	13.16	14.16	270	
	2	14.76	14.24	15.24	20	172.4
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

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PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-16 Date(s) Analyzed: 11/18/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Fluoranthene	1	12.97	12.64	13.64	46	
	2	14.23	13.73	14.73	39	16.5
Chrysene	1	16.91	16.75	17.75	57	
	2	16.24	15.52	16.52	30	62.1
Benzo(b)fluoranthene	1	18.62	18.68	19.68	110	
	2	17.41	17.00	18.00	160	37.0
Benzo(a)anthracene	1	16.34	16.00	17.00	3.4	
	2	16.24	15.52	16.52	30	159.3
Indeno(1,2,3-cd)pyrene	1	24.11	24.69	25.69	5.1	
	2	19.70	19.09	20.09	150	186.8
	1					
	2					
	1					
	2					
	1					
	2					

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PESTICIDE IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-18 Date(s) Analyzed: 11/18/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.89	13.43	14.43	51	
	2	15.01	14.24	15.24	13	118.8
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

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EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

40SB9F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-17 Date(s) Analyzed: 11/21/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.40	8.99	9.99	450	
	2	10.56	10.36	11.36	6500	174.1
Pyrene	1	13.63	13.16	14.16	280	
	2	14.81	14.24	15.24	48	141.5
Fluoranthene	1	12.94	12.37	13.37	95	
	2	14.26	13.73	14.73	380	120.0
Chrysene	1	16.79	16.32	17.32	1900	
	2	15.97	15.52	16.52	30	193.8
Benzo(b)fluoranthene	1	18.61	18.16	19.16	77	
	2	17.27	17.00	18.00	95	20.9
	1					
	2					
	1					
	2					
	1					
	2					

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PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS1

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-12 Date(s) Analyzed: 11/15/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.63	13.43	14.43	43	
	2	14.78	14.24	15.24	21	68.8
Fluoranthene	1	12.85	12.64	13.64	52	
	2	14.27	13.73	14.73	99	62.2
Chrysene	1	17.04	16.75	17.75	17	
	2	15.98	15.52	16.52	11	42.8
Benzo(b)fluoranthene	1	18.63	18.68	19.68	25	
	2	17.23	17.00	18.00	110	125.9
Benzo(k)fluoranthene	1	19.68	19.79	20.79	8.3	
	2	17.60	17.12	18.12	26	103.2
Benzo(a)anthracene	1	16.14	16.00	17.00	40	
	2	15.98	15.52	16.52	11	113.7
Benzo(a)pyrene	1	20.57	20.75	21.75	16	
	2	18.08	17.64	18.64	14	13.3
Indeno(1,2,3-cd)pyrene	1	24.20	24.69	25.69	110	
	2	19.50	19.09	20.09	16	149.2

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EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

40SS2

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-11 Date(s) Analyzed: 11/15/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	6.70	6.75	7.75	250	
	2	9.64	9.38	10.38	240	4.1
Acenaphthene	1	9.51	9.16	10.16	560	
	2	10.71	10.36	11.36	94	142.5
Pyrene	1	13.73	13.43	14.43	730	
	2	14.74	14.24	15.24	520	33.6
Phenanthrene	1	10.99	10.62	11.62	500	
	2	12.94	12.35	13.35	550	9.5
Anthracene	1	12.04	11.69	12.69	120	
	2	13.30	12.72	13.72	79	41.2
Fluoranthene	1	12.96	12.64	13.64	1000	
	2	14.23	13.73	14.73	1500	40.0
Chrysene	1	16.88	16.75	17.75	350	
	2	15.97	15.52	16.52	280	22.2
Benzo(b)fluoranthene	1	18.70	18.68	19.68	340	
	2	17.46	17.00	18.00	380	11.1

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PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS2

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-11 Date(s) Analyzed: 11/15/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(k)fluoranthene	1	20.07	19.79	20.79	53	
	2	17.61	17.12	18.12	370	149.9
Benzo(g,h,i)perylene	1	23.11	23.52	24.52	140	
	2	19.83	19.37	20.37	140	0.0
Benzo(a)anthracene	1	16.37	16.00	17.00	120	
	2	15.97	15.52	16.52	280	80.0
Benzo(a)pyrene	1	20.64	20.75	21.75	300	
	2	18.09	17.64	18.64	260	14.3
Indeno(1,2,3-cd)pyrene	1	24.11	24.69	25.69	220	
	2	19.51	19.09	20.09	250	12.8
	1					
	2					
	1					
	2					
	1					
	2					

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PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-10 Date(s) Analyzed: 11/15/02 11/23/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.36	6.75	7.75	160	
	2	9.53	9.38	10.38	130	20.7
Acenaphthene	1	9.38	9.16	10.16	190	
	2	10.62	10.36	11.36	64	99.2
Pyrene	1	13.68	13.43	14.43	230	
	2	14.71	14.24	15.24	160	35.9
Phenanthrene	1	10.91	10.62	11.62	110	
	2	12.87	12.35	13.35	120	8.7
Fluoranthene	1	12.87	12.64	13.64	300	
	2	14.18	13.73	14.73	530	55.4
Chrysene	1	17.08	16.75	17.75	14	
	2	15.96	15.52	16.52	83	142.3
Benzo(b)fluoranthene	1	18.56	18.68	19.68	100	
	2	17.49	17.00	18.00	100	0.0
Benzo(k)fluoranthene	1	19.89	19.79	20.79	58	
	2	17.64	17.12	18.12	100	53.2

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS3

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-10 Date(s) Analyzed: 11/15/02 11/23/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Dibenzo(a,h)anthracene	1	21.89	22.32	23.32	25	
	2	18.63	18.22	19.22	16	43.9
Benzo(g,h,i)perylene	1	23.81	23.52	24.52	110	
	2	19.91	19.37	20.37	33	107.7
Benzo(a)anthracene	1	16.28	16.00	17.00	34	
	2	15.96	15.52	16.52	83	83.8
Benzo(a)pyrene	1	21.21	20.75	21.75	4.0	
	2	18.14	17.64	18.64	62	175.8
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

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PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-7 Date(s) Analyzed: 11/15/02 11/23/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.35	6.75	7.75	710	
	2	9.66	9.38	10.38	1100	43.1
Acenaphthene	1	9.41	9.16	10.16	640	
	2	10.70	10.36	11.36	34	179.8
Pyrene	1	13.72	13.43	14.43	810	
	2	14.79	14.24	15.24	450	57.1
Phenanthrene	1	10.94	10.62	11.62	240	
	2	12.91	12.35	13.35	360	40.0
Fluoranthene	1	12.94	12.64	13.64	1100	
	2	14.26	13.73	14.73	1500	30.8
Chrysene	1	16.92	16.75	17.75	400	
	2	16.00	15.52	16.52	300	28.6
Benzo(b)fluoranthene	1	18.76	18.68	19.68	360	
	2	17.51	17.00	18.00	570	45.2
Benzo(k)fluoranthene	1	19.80	19.79	20.79	180	
	2	17.62	17.12	18.12	340	61.5

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-7 Date(s) Analyzed: 11/15/02 11/23/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(a)anthracene	1	16.21	16.00	17.00	390	
	2	16.00	15.52	16.52	300	26.1
Benzo(a)pyrene	1	20.71	20.75	21.75	120	
	2	18.12	17.64	18.64	95	23.2
Indeno(1,2,3-cd)pyrene	1	24.24	24.69	25.69	130	
	2	19.35	19.09	20.09	18	151.4
Acenaphthylene	1	8.01	7.80	8.80	220	
	2	12.38	11.51	12.51	86	87.6
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-8 Date(s) Analyzed: 11/15/02 11/23/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.34	9.16	10.16	250	
	2	10.74	10.36	11.36	91	93.2
Pyrene	1	13.62	13.43	14.43	120	
	2	14.68	14.24	15.24	60	66.7
Phenanthrene	1	10.84	10.62	11.62	100	
	2	12.85	12.35	13.35	100	0.0
Fluoranthene	1	12.85	12.64	13.64	220	
	2	14.16	13.73	14.73	340	42.8
Chrysene	1	16.87	16.75	17.75	89	
	2	15.89	15.52	16.52	40	76.0
Benzo(b)fluoranthene	1	18.75	18.68	19.68	130	
	2	17.39	17.00	18.00	91	35.3
Benzo(k)fluoranthene	1	19.82	19.79	20.79	68	
	2	17.53	17.12	18.12	120	55.3
Dibenzo(a,h)anthracene	1	22.22	22.32	23.32	32	
	2	18.70	18.22	19.22	110	109.8

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-8 Date(s) Analyzed: 11/15/02 11/23/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(g,h,i)perylene	1	23.23	23.52	24.52	37	
	2	19.98	19.37	20.37	22	50.8
Benzo(a)anthracene	1	16.35	16.00	17.00	67	
	2	15.89	15.52	16.52	40	50.5
Benzo(a)pyrene	1	20.73	20.75	21.75	38	
	2	18.02	17.64	18.64	23	49.2
Indeno(1,2,3-cd)pyrene	1	24.22	24.69	25.69	72	
	2	19.73	19.09	20.09	22	106.4
Acenaphthylene	1	7.97	7.80	8.80	80	
	2	11.98	11.51	12.51	19	123.2
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-9 Date(s) Analyzed: 11/15/02 11/23/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Fluoranthene	1	12.75	12.64	13.64	31	
	2	14.21	13.73	14.73	25	21.4
Chrysene	1	16.76	16.75	17.75	9.0	
	2	15.98	15.52	16.52	3.2	95.1
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-5 Date(s) Analyzed: 11/14/02 11/23/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.38	9.16	10.16	43	
	2	11.03	10.36	11.36	33	26.3
Pyrene	1	13.41	13.43	14.43	19	
	2	14.72	14.24	15.24	6.9	93.4
Fluoranthene	1	12.86	12.64	13.64	59	
	2	14.17	13.73	14.73	56	5.2
Benzo(a)anthracene	1	16.30	16.00	17.00	7.4	
	2	15.92	15.52	16.52	3.9	61.9
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A
PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

D-1

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-6 Date(s) Analyzed: 11/15/02 11/23/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.10	6.75	7.75	81	
	2	9.60	9.38	10.38	54	40.0
Acenaphthene	1	9.45	9.16	10.16	200	
	2	10.74	10.36	11.36	160	22.2
Pyrene	1	13.68	13.43	14.43	24	
	2	14.74	14.24	15.24	19	23.2
Fluoranthene	1	12.91	12.64	13.64	410	
	2	14.20	13.73	14.73	200	68.8
Benzo(b)fluoranthene	1	18.71	18.68	19.68	8.6	
	2	17.47	17.00	18.00	20	79.7
Benzo(k)fluoranthene	1	19.96	19.79	20.79	14	
	2	17.62	17.12	18.12	15	6.9
Benzo(a)anthracene	1	16.30	16.00	17.00	44	
	2	15.96	15.52	16.52	7.6	141.1
Benzo(a)pyrene	1	20.65	20.75	21.75	10	
	2	18.11	17.64	18.64	3.5	96.3

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 1/30/03
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: Q2788
Test Name: PEST
Method No.: 8081A

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	✓	✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes: It was noted by RD ID for 715B11 did not match between CoC, and Sample label.

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

collected	extracted	analyzed
11/11/02, 11/13/02	11/12/02	11/25/02	11/26/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes:

EBs in RZ788 all ND

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	✓	✓	
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		

Notes: See attached

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?			
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?			
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.			
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?			
5.4	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			
5.5	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).			
5.6	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	✓		
5.7	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	✓		
5.8	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	✓		

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
6.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?	✓		✓
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
	1 out	high/low	No action	No action
	2 out	2 high same column	K	No action
		2 low same column	L, UL	No action
		mixed same column	J, UJ	No action
		2 high diff columns	J	Not applicable
		2 low diff columns	J, UJ	Not applicable
		mixed diff columns	Professional judgement	Not applicable
	3 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		2 high, 1 low	K (2 high)	J (1 low 2nd column)
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
		other mixed	J, UJ	Not applicable
	4 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		Mixed	J, UJ	Not applicable
	If any recovery is >0% and <10% then L(+)/R(-).			
	If any recovery is 0% then R(+/-).			

Notes: SØSB12A Decachlorobiphenyl 560 > 43-144) one out no flags
4ØSS4 " 161 > " "
4ØSS2 " 38 < 43-144, and tetrachloro-m-xylene 40) 40 < 43-135
↓ L/UL's
re analyses had good surrogates - use those results.

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?			
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			✓

Notes:

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		✓	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes: see attached → J, q

11.0 Pesticide Cleanup Checks (Required when any positive result is reported > 38 ug/Kg for soils) PCBs for?		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			/
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			/
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			/
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			/

Notes: It should be noted that methoxychlor(43) in 40554. Cleanup was not performed.

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
12.1.4	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = _____			

Notes: No R flags

CompuChem

a division of Liberty Analytical Corporation
501 Madison Avenue
Cary, N.C. 27513
Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE
SDG #Q2788
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS:

40SB11B	**40SB12A**	**40SS1**	**40SS4**	**71SS11**
40SB11C	**40SB8A**	**40SS2**	**40SS5**	**71SS12**
40SB11F	**40SB9A**	**40SS3**	**71SB11**	**D-1**

The 15 soil samples listed above were received intact, with proper documentation, in sealed shipping containers, on November 12 through 14, 2002. The samples were scheduled for the requested analyses of the pesticide/PCB fractions. Samples 40SB11B, 40SB11C, and 40SB11F were received at a temperature of 4.6 degrees Celsius. Samples received for organic analysis are required to be preserved at 4 degrees Celsius. The client was contacted, and the laboratory was instructed to proceed with the analyses. As noted on the chain-of-custody (COC) documents, the client identifications for 71SB11 did not match between the COC and the sample label. Our policy is to use the identification found on the sample label in these circumstances. The Client was contacted and analysis proceeded as requested. SW-846, 3rd Edition, Update 3, Sonication extraction (Method 3550B), and Method 8081A/8082 were used to prepare and analyze these samples, with the exceptions and/or additions requested by the client. The percent moisture values of these soil samples ranged from 8 to 42. All pertinent Quality Assurance notices are included in the narrative section, and all pertinent Laboratory notices for SDG # Q2788 are included in the sample data sections.

Pesticides/PCBs

Extraction and analysis holding time requirements were met for all of these samples. Target compounds were confirmed by dual column above the Quantitation Limit (QL) in most of these samples. Manual quantitations were performed on one or more of the process files associated with this SDG, including samples 40SB11C, 40SB12A, 40SB8A, 40SB9A, 40SS2, 40SS3, 40SS4, 40SS5, 71SB11, 71SB12, and D-1. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG. The extracts chain of custody was misplaced and therefore is not included in the chain of custody section of the data package.

Overall QC criteria were met for all initial and continuing calibration standards associated to this SDG. The PEM associated with the ICAL analyzed on 11/06/02 on VARIAN70/72 exceeded the 4,4'-DDT percent breakdown by 1.6 and 0.8 percent respectively. All other PEM associated with the 12-hr period analysis of the samples in this SDG met breakdown criteria. Per SW846 Method 8081A protocol, PEM analysis is not required prior to the analysis of the ICAL.

All of the surrogates met recovery criteria with several exceptions. The recovery of DCB fell above the quality control limits in the analyses of 40SB12A and 40SS4. The baseline integration of the surrogates was reassessed for these samples per client's instruction. TCX and DCB failed recovery criteria in sample 40SS2. Reanalysis of 40SS2 resulted in acceptable recovery.

The associated method blanks met all quality control criteria. The associated Laboratory Control Sample (LCS) met overall accuracy criteria. There is no matrix spike /matrix spike duplicate (MS/MSD) associated with this SDG since the sample designated to prepare the MS/MSD did not have pesticide analysis requested.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Elsie S. Byrd
Senior Scientist I
December 10, 2002

"csmith"
<csmith@compuchemlabs.com>

02/05/03 08:39 AM

To: <Roshanak_Aryan@URSCorp.com>
cc:
Subject: RE: Pesticide cleanup for SDG Q2788

Good morning Roshanak,

I apologize for the slow response. I found that according to the extraction sheet (dated 11/25/02), cleanup was not performed on any of the samples in this SDG.

Chuck Smith

-----Original Message-----
From: Roshanak_Aryan@URSCorp.com [mailto:Roshanak_Aryan@URSCorp.com]
Sent: Monday, February 03, 2003 4:09 PM
To: csmith@compuchemlabs.com
Subject: Pesticide cleanup for SDG Q2788

Hi. I noticed during the review of pesticide in this SDG that no pesticide clean up check CLP forms were provided. Was this done for this SDG? It should have been done since the methoxychlor result in sample 40SS4 is very high at 43 ug/Kg. Please let me know if this clean up was performed and if yes, where we could locate the forms. Thanks.

Roshanak Aryan
Senior Chemical Engineer
URS Corporation
849 International Dr. Suite 320
Linthicum, Maryland 21090
Phone: 410-859-5049
Fax: 410-859-5202

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN70 Calibration Date: 11/14/02 Time: 1546

Lab File ID: 237OINDAMPN Init. Calib. Date(s): 11/06/02 11/07/02

Init. Calib. Times: 2219 0524

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1636700.0	1688375.0	0.01	3.16	15.00	AVRG	
alpha-BHC	1743700.0	1862125.0	0.01	6.79	15.00	AVRG	
beta-BHC	474448.75	466487.50	0.01	-1.68	15.00	AVRG	
delta-BHC	1590457.5	1679350.0	0.01	5.59	15.00	AVRG	
gamma-BHC (Lindane)	1601990.0	1717925.0	0.01	7.24	15.00	AVRG	
4,4'-DDD	909717.50	963693.75	0.01	5.93	15.00	AVRG	
4,4'-DDE	1257772.5	1226850.0	0.01	-2.46	15.00	AVRG	
4,4'-DDT	475154.58	579095.83	0.01	21.88	15.00	AVRG	<-
Dieldrin	1305668.7	1311237.5	0.01	0.43	15.00	AVRG	
Endosulfan I	1217813.7	1234550.0	0.01	1.37	15.00	AVRG	
Endosulfan II	1022249.4	1019200.0	0.01	-0.30	15.00	AVRG	
Endosulfan sulfate	874654.38	886975.00	0.01	1.41	15.00	AVRG	
Endrin	1256066.9	1287237.5	0.01	2.48	15.00	AVRG	
Endrin Aldehyde	798581.88	817312.50	0.01	2.34	15.00	AVRG	
Heptachlor	1651499.1	1803675.0	0.01	9.21	15.00	AVRG	
Heptachlor Epoxide	1488947.5	1535625.0	0.01	3.13	15.00	AVRG	
Methoxychlor	348585.50	415647.50	0.01	19.24	15.00	AVRG	<-
Toxaphene	45377.750		0.01	-100.00	15.00	AVRG	<-
(2)	77612.750		0.01	-100.00	15.00	AVRG	<-
(3)	85525.250		0.01	-100.00	15.00	AVRG	<-
(4)	60087.250		0.01	-100.00	15.00	AVRG	<-
(5)	19852.000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	8564.3330	7864.3333	0.01	-8.17	15.00	AVRG	
(2)	10520.433	9624.0000	0.01	-8.52	15.00	AVRG	
(3)	25190.867	26826.667	0.01	6.49	15.00	AVRG	
(4)	12210.367	12380.667	0.01	1.39	15.00	AVRG	
(5)	10324.833	10203.000	0.01	-1.18	15.00	AVRG	
Aroclor-1221	2578.0000		0.01	-100.00	15.00	AVRG	<-
(2)	3732.0000		0.01	-100.00	15.00	AVRG	<-
(3)	2447.5000		0.01	-100.00	15.00	AVRG	<-
(4)	10444.250		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	10242.000		0.01	-100.00	15.00	AVRG	<-
(2)	4157.0000		0.01	-100.00	15.00	AVRG	<-
(3)	11776.333		0.01	-100.00	15.00	AVRG	<-
(4)	4033.0000		0.01	-100.00	15.00	AVRG	<-
(5)	3776.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	7583.5000		0.01	-100.00	15.00	AVRG	<-
(2)	8349.5000		0.01	-100.00	15.00	AVRG	<-
(3)	20501.500		0.01	-100.00	15.00	AVRG	<-
(4)	12731.000		0.01	-100.00	15.00	AVRG	<-
(5)	8600.5000		0.01	-100.00	15.00	AVRG	<-

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN70 Calibration Date: 11/14/02 Time: 2252

Lab File ID: 253OINDAMPP Init. Calib. Date(s): 11/06/02 11/07/02

Init. Calib. Times: 2219 0524

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1636700.0	1483175.0	0.01	-9.38	15.00	AVRG	
alpha-BHC	1743700.0	1620775.0	0.01	-7.05	15.00	AVRG	
beta-BHC	474448.75	420987.50	0.01	-11.27	15.00	AVRG	
delta-BHC	1590457.5	1515900.0	0.01	-4.69	15.00	AVRG	
gamma-BHC (Lindane)	1601990.0	1497650.0	0.01	-6.51	15.00	AVRG	
4,4'-DDD	909717.50	780750.00	0.01	-14.18	15.00	AVRG	
4,4'-DDE	1257772.5	1051637.5	0.01	-16.39	15.00	AVRG	<-
4,4'-DDT	475154.58	387275.00	0.01	-18.49	15.00	AVRG	<-
Dieldrin	1305668.7	1161750.0	0.01	-11.02	15.00	AVRG	
Endosulfan I	1217813.7	1069975.0	0.01	-12.14	15.00	AVRG	
Endosulfan II	1022249.4	915812.50	0.01	-10.41	15.00	AVRG	
Endosulfan sulfate	874654.38	786300.00	0.01	-10.10	15.00	AVRG	
Endrin	1256066.9	1141762.5	0.01	-9.10	15.00	AVRG	
Endrin Aldehyde	798581.88	701856.25	0.01	-12.11	15.00	AVRG	
Heptachlor	1651499.1	1560550.0	0.01	-5.51	15.00	AVRG	
Heptachlor Epoxide	1488947.5	1335800.0	0.01	-10.28	15.00	AVRG	
Methoxychlor	348585.50	290602.50	0.01	-16.63	15.00	AVRG	<-
Toxaphene	45377.750		0.01	-100.00	15.00	AVRG	<-
(2)	77612.750		0.01	-100.00	15.00	AVRG	<-
(3)	85525.250		0.01	-100.00	15.00	AVRG	<-
(4)	60087.250		0.01	-100.00	15.00	AVRG	<-
(5)	19852.000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	8564.3330	7166.6667	0.01	-16.32	15.00	AVRG	<-
(2)	10520.433	8624.0000	0.01	-18.03	15.00	AVRG	<-
(3)	25190.867	22374.667	0.01	-11.18	15.00	AVRG	
(4)	12210.367	10671.667	0.01	-12.60	15.00	AVRG	
(5)	10324.833	8524.6667	0.01	-17.44	15.00	AVRG	<-
Aroclor-1221	2578.0000		0.01	-100.00	15.00	AVRG	<-
(2)	3732.0000		0.01	-100.00	15.00	AVRG	<-
(3)	2447.5000		0.01	-100.00	15.00	AVRG	<-
(4)	10444.250		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	10242.000		0.01	-100.00	15.00	AVRG	<-
(2)	4157.0000		0.01	-100.00	15.00	AVRG	<-
(3)	11776.333		0.01	-100.00	15.00	AVRG	<-
(4)	4033.0000		0.01	-100.00	15.00	AVRG	<-
(5)	3776.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	7583.5000		0.01	-100.00	15.00	AVRG	<-
(2)	8349.5000		0.01	-100.00	15.00	AVRG	<-
(3)	20501.500		0.01	-100.00	15.00	AVRG	<-
(4)	12731.000		0.01	-100.00	15.00	AVRG	<-
(5)	8600.5000		0.01	-100.00	15.00	AVRG	<-

UJ, C

avg. ok ✓

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN72 Calibration Date: 11/14/02 Time: 2252

Lab File ID: 2530INDAMPP Init. Calib. Date(s): 11/06/02 11/07/02

Init. Calib. Times: 2219 0524

GC Column: CLPEST2 ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aroclor-1248	49964.000		0.01	-100.00	15.00	AVRG	<-
(2)	34658.500		0.01	-100.00	15.00	AVRG	<-
(3)	94788.000		0.01	-100.00	15.00	AVRG	<-
(4)	53956.500		0.01	-100.00	15.00	AVRG	<-
(5)	53956.500		0.01	-100.00	15.00	AVRG	<-
Aroclor-1254	63336.500		0.01	-100.00	15.00	AVRG	<-
(2)	151043.50		0.01	-100.00	15.00	AVRG	<-
(3)	179786.50		0.01	-100.00	15.00	AVRG	<-
(4)	177721.00		0.01	-100.00	15.00	AVRG	<-
(5)	203548.00		0.01	-100.00	15.00	AVRG	<-
Aroclor-1260	282829.70	216293.33	0.01	-23.52	15.00	AVRG	<-
(2)	161392.03	131488.33	0.01	-18.53	15.00	AVRG	<-
(3)	331159.60	266868.00	0.01	-19.41	15.00	AVRG	<-
(4)	273707.80	216766.00	0.01	-20.80	15.00	AVRG	<-
(5)	64490.367	70025.667	0.01	8.58	15.00	AVRG	
Endrin Ketone	2348927.7	2163612.5	0.01	-7.89	15.00	AVRG	
gamma-Chlordane	4247410.0	3877125.0	0.01	-8.72	15.00	AVRG	
alpha-Chlordane	3789783.8	3516100.0	0.01	-7.22	15.00	AVRG	
Decachlorobiphenyl (DCB)	2047647.2	1813293.8	0.01	-11.44	15.00	AVRG	
Tetrachloro-m-Xylene	1463154.1	1465037.5	0.01	0.13	15.00	AVRG	

avg = -16.5

UJC

FORM VII PEST

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Instrument ID: VARIAN70 Calibration Date: 11/25/02 Time: 2131

Lab File ID: 176PINDAMRX Init. Calib. Date(s): 11/18/02 11/18/02

Init. Calib. Times: 1528 2234

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1815545.0	1850325.0	0.01	1.92	15.00	AVRG	
alpha-BHC	1906462.5	1976050.0	0.01	3.65	15.00	AVRG	
beta-BHC	498746.25	484412.50	0.01	-2.87	15.00	AVRG	
delta-BHC	1707982.5	1765600.0	0.01	3.37	15.00	AVRG	
gamma-BHC (Lindane)	1799997.5	1815700.0	0.01	0.87	15.00	AVRG	
4,4'-DDD	845857.50	989493.75	0.01	16.98	15.00	AVRG	<-
4,4'-DDE	1270732.5	1215950.0	0.01	-4.31	15.00	AVRG	
4,4'-DDT	610179.17	678254.17	0.01	11.16	15.00	AVRG	
Dieldrin	1440223.7	1480875.0	0.01	2.82	15.00	AVRG	
Endosulfan I	1346278.7	1378262.5	0.01	2.38	15.00	AVRG	
Endosulfan II	1112272.5	1147237.5	0.01	3.14	15.00	AVRG	
Endosulfan sulfate	945950.62	955050.00	0.01	0.96	15.00	AVRG	
Endrin	1368336.9	1379675.0	0.01	0.83	15.00	AVRG	
Endrin Aldehyde	861539.37	876900.00	0.01	1.78	15.00	AVRG	
Heptachlor	1886787.7	1943300.0	0.01	3.00	15.00	AVRG	
Heptachlor Epoxide	1611297.5	1628375.0	0.01	1.06	15.00	AVRG	
Methoxychlor	428964.25	483092.50	0.01	12.62	15.00	AVRG	
Toxaphene	47823.000		0.01	-100.00	15.00	AVRG	<-
(2)	78871.750		0.01	-100.00	15.00	AVRG	<-
(3)	93095.250		0.01	-100.00	15.00	AVRG	<-
(4)	68357.750		0.01	-100.00	15.00	AVRG	<-
(5)	22105.250		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	9182.3330	8978.3333	0.01	-2.22	15.00	AVRG	
(2)	11126.600	10822.667	0.01	-2.73	15.00	AVRG	
(3)	27400.767	25844.000	0.01	-5.68	15.00	AVRG	
(4)	13085.600	12743.333	0.01	-2.62	15.00	AVRG	
(5)	7801.6000	7414.3333	0.01	-4.96	15.00	AVRG	
Aroclor-1221	2457.7500		0.01	-100.00	15.00	AVRG	<-
(2)	3863.2500		0.01	-100.00	15.00	AVRG	<-
(3)	2556.2500		0.01	-100.00	15.00	AVRG	<-
(4)	10702.000		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	9191.3330		0.01	-100.00	15.00	AVRG	<-
(2)	4081.0000		0.01	-100.00	15.00	AVRG	<-
(3)	9926.3330		0.01	-100.00	15.00	AVRG	<-
(4)	2778.0000		0.01	-100.00	15.00	AVRG	<-
(5)	2653.6670		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	7944.5000		0.01	-100.00	15.00	AVRG	<-
(2)	8640.5000		0.01	-100.00	15.00	AVRG	<-
(3)	21391.500		0.01	-100.00	15.00	AVRG	<-
(4)	10349.500		0.01	-100.00	15.00	AVRG	<-
(5)	5849.0000		0.01	-100.00	15.00	AVRG	<-

all ND no PMP

2F
SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

GC Column(1): CLPEST ID: 0.53 (mm) GC Column(2): CLPEST2 ID: 0.53 (mm)

	EPA SAMPLE NO.	S1 1 %REC	#	S1 2 %REC	#	TCX 1 %REC	#	TCX 2 %REC	#	OTHER (1)	OTHER (2)	TOT OUT
01	PBLKTV	96		96		130		90				0
02	40SS2RE	47		55		62		60				0
03	PBLKYK	100		106		120		129				0
04	PLCSYK	88		94		110		76				0
05	PCBLCSYK	98		104		110		94				0
06	40SB12A	560	*	101		65		74				1
07	71SB11	87		107		99		87				0
08	40SS4	85		161	*	130		109				1
09	40SS3	67		112		92		98				0
10	40SS2	53		38	*	40	*	40	*			3
11	40SB11B	77		68		61		67				0
12	40SB11C	77		74		100		99				0
13	40SB9A	75		86		96		107				0
14	40SB8A	79		87		94		78				0
15	71SS12	92		92		100		68				0
16	D-1	110		92		75		69				0
17	40SS5	80		127		68		64				0
18	71SS11	82		83		73		78				0
19	40SB11F	61		67		62		60				0
20	40SS1	74		97		120		121				0
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

ADVISORY QC LIMITS

S1 = Decachlorobiphenyl (DC (43-144)
S2 (TCX) = Tetrachloro-m-Xylene (43-135)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

10A
PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB11B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-14 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
beta-BHC	1	5.45	5.33	5.47	0.75	
	2	6.72	6.63	6.77	1.4	60.5
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB11C

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-15 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
alpha-BHC	1	4.66	4.59	4.73	0.44	
	2	5.84	5.75	5.89	0.95	73.4
beta-BHC	1	5.46	5.33	5.47	4.2	
	2	6.72	6.63	6.77	2.4	54.5
delta-BHC	1	5.65	5.62	5.76	0.97	
	2	7.23	7.17	7.31	1.4	36.3
gamma-BHC (Lindane)	1	5.20	5.15	5.29	0.40	
	2	6.49	6.45	6.59	0.55	31.6
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

40SB12A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-1 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
beta-BHC	1	5.46	5.33	5.47	12	
	2	6.73	6.63	6.77	1.2	163.6
gamma-BHC (Lindane)	1	5.19	5.15	5.29	0.13	
	2	6.49	6.45	6.59	0.55	123.5
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB8A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-19 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
beta-BHC	1	5.44	5.33	5.47	21	
	2	6.72	6.63	6.77	1.6	171.7
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB9A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-16 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
beta-BHC	1	5.44	5.33	5.47	6.6	
	2	6.72	6.63	6.77	1.7	118.1
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS2RE

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-11 Date(s) Analyzed: 11/15/02 11/15/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
beta-BHC	1	5.42	5.32	5.46	0.46	
	2	6.64	6.61	6.75	2.1	128.1
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

40SS4

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-7 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Aldrin	1	6.47	6.47	6.61	5.1	
	2	7.94	7.84	7.97	1.0	134.4
beta-BHC	1	5.41	5.33	5.47	36	
	2	6.73	6.63	6.77	8.1	126.5
gamma-BHC (Lindane)	1	5.25	5.15	5.29	0.74	
	2	6.45	6.45	6.59	11	174.8
4,4'-DDT	1	9.74	9.69	9.83	7.7	
	2	11.43	11.38	11.52	3.5	75.0
Dieldrin	1	8.69	8.61	8.75	3.0	
	2	10.10	10.05	10.19	30	163.6
Endosulfan sulfate	1	10.86	10.83	10.97	29	
	2	12.13	12.01	12.15	18	46.8
Endrin	1	9.01	8.98	9.12	2.9	
	2	10.57	10.57	10.71	3.9	29.4
Methoxychlor	1	10.72	10.58	10.72	43	
	2	12.65	12.60	12.74	42	2.4

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS4

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-7 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Endrin Ketone	1	11.36	11.27	11.41	24	
	2	12.96	12.91	13.05	3.8	145.3
gamma-Chlordane	1	7.79	7.75	7.89	7.6	
	2	9.24	9.22	9.36	5.4	33.8
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SS5

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-8 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Aldrin	1	6.47	6.47	6.61	2.1	
	2	7.86	7.84	7.97	0.46	128.1
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

71SB11

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-4 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Aldrin	1	6.48	6.47	6.61	0.86	
	2	7.86	7.84	7.97	0.24	112.7
beta-BHC	1	5.45	5.33	5.47	5.5	
	2	6.72	6.63	6.77	2.8	65.1
gamma-BHC (Lindane)	1	5.25	5.15	5.29	0.34	
	2	6.47	6.45	6.59	0.99	97.7
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

71SS11

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-9 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
beta-BHC	1	5.46	5.33	5.47	3.4	
	2	6.73	6.63	6.77	0.66	135.0
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

71SS12

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-5 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Aldrin	1	6.48	6.47	6.61	1.0	
	2	7.87	7.84	7.97	0.35	96.3
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

D-1

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-6 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Aldrin	1	6.48	6.47	6.61	1.1	
	2	7.86	7.84	7.97	0.34	105.6
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10B

PESTICIDE IDENTIFICATION SUMMARY FOR MULTICOMPONENT ANALYTES

EPA SAMPLE NO.

71SB11

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2788

Lab Sample ID: Q2788-4 Date(s) Analyzed: 11/26/02 11/26/02

Instrument ID (1): VARIAN70 Instrument ID (2): VARIAN72

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	7.76	7.70	7.84	56		
Aroclor-1254	2	8.42	8.37	8.51	8.7		
	3	8.91	8.87	9.01	27		
COLUMN 1	4	9.21	9.16	9.30	51		
	5	9.68	9.63	9.77	27	34	
	1	9.03	8.92	9.06	23		
	2	9.31	9.26	9.40	13		
	3	10.12	10.06	10.21	19		
COLUMN 2	4	10.52	10.47	10.62	14		
	5	11.43	11.38	11.53	23	18	61.5
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

FORM X PEST-2

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: AJ
Date: 01/30/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU ~~54~~
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: Q2788
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	X		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: cooler temp for COC 1014 samples (SB8A, SB8F) too low at 1.1°C. No action taken.

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.			

Notes: cooler temps COC 1003: 3.2°C, 1004: 3.1°C, 1010: 5.6°C, 1013: 2.0°C, 1014: 1.1°C. No action taken for samples received too cold.
sampled: 11/11/02, 11/12/02, 11/13/02,
extracted: 11/18/02, 11/14/02
analysis: 11/24/02, 11/23/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			X

Notes: No field/equipment blanks in this data package.

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).	X		
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? 50-150%	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits? 70, 74 %		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits? 60 %		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: ms/msd for this batch from sample 405B9C

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits? 82% 86% 50-150%		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: NO LCSD

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: D-1 =

All results N.D.

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: Ø			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: Q2788
Project No.: 15295137.10000

Project Name: Radford SWMU 40/71
Reviewer: RH
Date: 11/28/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{O}C \pm 2\ ^{O}C$)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: collected 11/11/02 13:02 5
CVAA (Hg) 11/18/02 Hg
11/16/11/18/02 ICP

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%?		✓				
	<50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						

Note: CRDL ✓

1000 Ca 89 %

5 Cu 87.6

3 Pb 73

1000 Potassium 65.8 L1W

5 Silver 113 K1W

10 Tl 110.5 K1W

20 Zinc 70.1 L1W

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L						
4.5	Are there reported field blankor trip blank values > ± MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						

Note: MB neg for ca, zinc acc pos → LIP unless prev flagged
ICB, CCB low levels antimony, mg, mn, Tl and neg for ca, zinc
all <5X or ND, remove flags
EBs in RZ788 pos. bg, Cr, Mn, silver, Sodium, V. Pos sodium <5x → B, JC

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.	✓			✓		

Note:

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓		
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L						
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.		✓			✓	

Note: antimony 34.2/136% L/UL,M se 62.9/72.9 L/UL,M unless prev flagged
Pb 210.8/[redacted] 237.9 K,M Tl 48.2/48.2 L/UL,M
Mn 51.5/[redacted] 179.6 AS MSD 227 K,M

9.0 Instrument Detection Limits (IDL) K,M Cu U 125.4 K,M

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note:
Potassium 16.1%. J,S unless prev flagged

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?						
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report						

Note: _____

_____

_____

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓		
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note: _____

_____

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples:_____						
13.1.2	Number of target compounds in each analysis:_____						
13.1.3	Number of results rejected and not reported:_____						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = _____						

Note: _____

_____

_____

SW846 METALS

2B-IN

CRDL STANDARD FOR AA AND ICP

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: Q2788

AA CRDL Standard Source: HIPUR

ICP CRDL Standard Source: HIPUR

Concentration Units: ug/L

Analyte	True	Found	%R	CRDL Standard for ICP Initial True	Initial Found	Initial %R	Final Found	Final %R
Aluminum				100.0	105.20	105.2		
Antimony				10.0	10.92	109.2		
Arsenic				10.0	9.72	97.2		
Barium				10.0	10.00	100.0		
Beryllium				5.0	4.92	98.4		
Cadmium				5.0	5.21	104.2		
Calcium				1000.0	890.18	89.0		
Chromium				5.0	4.96	99.2		
Cobalt				5.0	5.07	101.4		
Copper				5.0	4.38	87.6		
Iron				100.0	96.47	96.5		
Lead				3.0	2.19	73.0		
Magnesium				1000.0	983.65	98.4		
Manganese				10.0	10.10	101.0		
Mercury	0.2	0.20	100.0					
Nickel				5.0	5.36	107.2		
Potassium				1000.0	687.65	68.8		
Selenium				5.0	4.62	92.4		
Silver				5.0	5.65	113.0		
Sodium				2000.0	2151.84	107.6		
Thallium				10.0	11.05	110.5		
Vanadium				20.0	20.04	100.2		
Zinc				20.0	14.02	70.1		

Control Limits: no limits have been established by EPA at this time

SW846 METALS

3

BLANKS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: Q2788

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	56.7	U	56.7	U	56.7	U	56.7	U	5.670	U	P
Antimony	1.2	U	2.0	B	1.2	U	1.2	U	0.120	U	P
Arsenic	3.0	U	3.0	U	3.0	U	3.0	U	0.300	U	P
Barium	0.3	U	0.3	U	0.3	B	0.3	U	0.030	U	P
Beryllium	0.2	U	0.3	B	0.3	B	0.3	B	0.020	U	P
Cadmium	0.3	U	0.3	U	0.3	U	0.3	U	0.030	U	P
Calcium ✓	-59.4	B	-24.3	B	-52.2	B	15.0	U	-5.441	B	P
Chromium	0.8	U	0.8	U	0.8	U	0.8	U	0.080	U	P
Cobalt	0.7	U	0.7	U	0.7	U	0.7	U	0.070	U	P
Copper	1.5	U	1.5	U	1.5	U	1.5	U	0.150	U	P
Iron	12.5	U	12.5	U	12.5	U	12.5	U	1.250	U	P
Lead	1.2	U	1.2	U	1.2	U	1.2	U	0.120	U	P
Magnesium	12.3	U	37.2	B	14.1	B	52.3	B	1.230	U	P
Manganese	0.2	U	0.3	B	0.3	B	0.3	B	0.020	U	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.017	U	CV
Nickel	1.0	U	1.0	U	1.0	U	1.0	U	0.100	U	P
Potassium	40.1	U	40.1	U	40.1	U	40.1	U	4.010	U	P
Selenium	3.0	U	3.0	U	3.0	U	3.0	U	0.300	U	P
Silver	0.8	U	0.8	U	0.8	U	0.8	U	0.080	U	P
Sodium	304.4	U	304.4	U	304.4	U	304.4	U	30.440	U	P
Thallium	2.4	U	2.4	U	2.4	U	2.4	B	0.240	U	P
Vanadium	0.7	U	0.7	U	0.7	U	0.7	U	0.070	U	P
Zinc ✓	-4.5	B	-4.2	B	-4.2	B	-4.3	B	-0.324	B	P

SW846 METALS

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

40SB9CS

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 76.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	22.8838		0.6401	B	65.02	34.2	N	P
Arsenic	75 - 125	11.0907		5.6654		5.20	104.3		P
Barium	75 - 125	293.4909		51.8304		260.08	92.9		P
Beryllium	75 - 125	7.2033		1.3630		6.50	89.9		P
Cadmium	75 - 125	5.1498		0.0390	U	6.50	79.2		P
Chromium	75 - 125	71.2303		39.4839		26.01	122.1		P
Cobalt	75 - 125	70.6510		13.5473		65.02	87.8		P
Copper	75 - 125	62.6315		25.3897		32.51	114.6		P
Lead	75 - 125	15.4599		9.9779		2.60	210.8	N	P
Manganese	75 - 125	269.5107		236.0055		65.02	51.5	N	P
Mercury	75 - 125	0.2633		0.0584		0.22	93.1		CV
Nickel	75 - 125	82.0788		21.2555		65.02	93.5		P
Selenium	75 - 125	1.9776		1.1594		1.30	62.9	N	P
Silver	75 - 125	5.6262		0.1040	U	6.50	86.6		P
Thallium	75 - 125	3.1348		0.3121	U	6.50	48.2	N	P
Vanadium	75 - 125	134.0138		62.5814		65.02	109.9		P
Zinc	75 - 125	95.5010		36.5814		65.02	90.6		P

Comments:

SW846 METALS

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

40SB9CSD

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 76.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	24.0328		0.6401	B	65.02	36.0	N	P
Arsenic	75 - 125	17.4672		5.6654		5.20	227.0	N	P
Barium	75 - 125	298.8269		51.8304		260.08	95.0		P
Beryllium	75 - 125	7.2847		1.3630		6.50	91.1		P
Cadmium	75 - 125	5.2694		0.0390	U	6.50	81.1		P
Chromium	75 - 125	71.2651		39.4839		26.01	122.2		P
Cobalt	75 - 125	71.5506		13.5473		65.02	89.2		P
Copper	75 - 125	66.1546		25.3897		32.51	125.4	N	P
Lead		16.1634		9.9779		2.60	237.9	N	P
Manganese		352.8128		236.0055		65.02	179.6	N	P
Mercury	75 - 125	0.2447		0.0584		0.22	84.7		CV
Nickel	75 - 125	83.1678		21.2555		65.02	95.2		P
Selenium	75 - 125	2.1077		1.1594		1.30	72.9	N	P
Silver	75 - 125	5.7584		0.1040	U	6.50	88.6		P
Thallium	75 - 125	3.1311		0.3121	U	6.50	48.2	N	P
Vanadium	75 - 125	133.0612		62.5814		65.02	108.4		P
Zinc	75 - 125	99.2238		36.5814		65.02	96.3		P

Comments:

55

9
ICP SERIAL DILUTIONS

SAMPLE NO.

40SB9CL

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	201093.59		193712.20		3.7		P
Antimony	4.92	B	7.09	B	44.1		P
Arsenic	43.57		45.32	B	4.0		P
Barium	398.58		409.48		2.7		P
Beryllium	10.48		11.13	B	6.2		P
Cadmium	0.30	U	1.50	U			P
Calcium	3274.52		3186.90	B	2.7		P
Chromium	303.63		318.72		5.0		P
Cobalt	104.18		110.79		6.3		P
Copper	195.25		195.88		0.3		P
Iron	247174.80		262165.31		6.1		P
Lead	76.73		80.06		4.3		P
Magnesium	105368.10		109666.40		4.1		P
Manganese	1814.88		1919.91		5.8		P
Nickel	163.45		176.70		8.1		P
Potassium	28246.24		23709.94		16.1	E	P
Selenium	8.92		15.00	U	100.0		P
Silver	0.80	U	4.00	U			P
Sodium	34327.57		36796.05		7.2		P
Thallium	2.40	U	12.00	U			P
Vanadium	481.25		501.59		4.2		P
Zinc	281.31		279.19		0.8		P

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-3

Level (low/med): LOW Date Received: 11/13/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	1.0	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	1.3	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	12.5	U		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.41	B		P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.1	U		P	UL,CV
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	3.0	B		P	~~K,O~~ B,O
7440-23-5	Sodium	887	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.99	B		P	
7440-66-6	Zinc	1.1	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-4

Level (low/med): LOW Date Received: 11/13/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.33	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	1.5	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	12.5	U		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.35	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.1	U		P	UL,W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.5	B		P	~~K,W~~ B,O
7440-23-5	Sodium	638	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-6

Level (low/med): LOW Date Received: 11/14/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.39	B		P	
7440-41-7	Beryllium	0.31	B		P	B,O
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	1.6	B		P	
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	12.6	B		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	21.0	B		P	B,O
7439-96-5	Manganese	0.63	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.1	U		P	UL,W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.5	B		P	B,O
7440-23-5	Sodium	758	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.2	B		P	B,O

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-8

Level (low/med): LOW Date Received: 11/15/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.36	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL|W
7440-47-3	Chromium	0.84	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL|W
7439-89-6	Iron	12.5	U		P	
7439-92-1	Lead	1.2	U		P	UL|W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.53	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.1	U		P	UL|W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.7	B		P	B,O
7440-23-5	Sodium	529	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL|W

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-10

Level (low/med): LOW Date Received: 11/16/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	80.4	B		P	B,O
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	3.1	B		P	
7440-41-7	Beryllium	0.21	B		P	B,O
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	1.8	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	12.5	U		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.46	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.1	U		P	UL,W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.5	B		P	B,O
7440-23-5	Sodium	699	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-12

Level (low/med): LOW Date Received: 11/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.30	U		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	1.9	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	12.7	B		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.58	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.8	B		P	K,W
7440-09-7	Potassium	49.8	B		P	L,W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	3.0	B		P	B,O
7440-23-5	Sodium	833	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-14

Level (low/med): LOW Date Received: 11/20/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.32	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL1W
7440-47-3	Chromium	1.9	B		P	B10
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.7	B		P	L1W
7439-89-6	Iron	13.3	B		P	
7439-92-1	Lead	1.2	U		P	UL1W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.70	B		P	B10
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	48.0	B		P	L1W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.7	B		P	B10
7440-23-5	Sodium	929	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL1W

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-16

Level (low/med): LOW Date Received: 11/21/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.33	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	2.0	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	15.7	B		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.61	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.7	B		P	L,W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.7	B		P	B,O
7440-23-5	Sodium	1110	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1013

Project Number	Project Name
09604-258	RFAAP

Project Contact (Name and Phone Number): Darren Rowe

Samplers: Fisher / Spangler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405B10A	11/13/02 800	5		X	9	E		4		X	X	X	X	X		X							
405B10F	810	5		X	9	E		3		X	X		X	X		X							
405B10B	820	5		X	9	E		3		X	X		X	X		X							
405B10C	830	5		X	9	E		3		X	X		X	X		X							
*405B9A	845	5		X	9	E		4		X	X	X	X	X		X							GCB 11-14-02 Only received 3 soil jars and received 1 soil without any ID on it. (Blank) CS 11/14/02
405B9F	855	5		X	9	E		3		X	X		X	X		X							
405B9C	930	5		X	9	E		3		X	X		X	X		X							
405B9CMS	950	5		X	9	E		3		X	X		X	X		X							
405B9CMSD	930	5		X	9	E		3		X	X		X	X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Other

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brad Fisher	11/13/02 1800				
Relinquished by:	Date/time	Received by: (for lab) Vincent Bibby	Date/Time 11-14-02 9:00 am	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1014

Project Number	Project Name
07604-258	RFAAP

Project Contact (Name and Phone Number): Darren Rennel

Samplers: Fisher / Spangler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405B8A	11/13/02 1000	5		X	9	E		4		X	X	X	X	X		X							
405B8F	1015			X				3		X	X		X	X		X							
405B8C	1030			X				3		X	X		X	X		X							
405B7A	1100			X				4		X	X	X	X	X		X							
405B7F	1120			X				3		X	X		X	X		X							
[redacted]D-2				X				3		X	X		X	X		X							
405B7B	1145			X				3		X	X		X	X		X							
405B7C	1200			X				3		X	X		X	X		X							
405B[redacted]A	1400			X				4		X	X	X	X	X		X							
405B6F	1415			X				3		X	X	[redacted]	[redacted]	X		X							PCB fm 405B6F
405B6C	1430			X				3		X	X	[redacted]	X	X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	11/13/02 1800				
Relinquished by: [signature]	Date/time 11/14/02	Received by: (for lab) Breeze A. Baby	Date/Time 11-14-02 9:00	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp = 0°C (1.1°C) CAB 11-14-02

Radford Army Ammunition Plant
Chain Of Custody Record

No 01010

Project Number	Project Name
8960425B	RFAAP

Project Contact (Name and Phone Number): Darren Renne

Samplers: Brett Fisher John Spyke

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405B11F	11/12/02 1000	5		X	9	E		8	X	X	X	X	X	X		X							Some glass in sample 40z. Sample jar is labeled as 405B11 CS 11-13-02
405B11B	11/12/02 1050	5		X	9	E		7	X	X	X	X	X	X		X							
405B11C	11/12/02 1100	5		X	9	E		7	X	X	X	X	X	X		X							
EQB-1	11/12/02 930	5		X	4	E		3	X														
EQB-2	11/12/02 1200	5		X	4	E		6	X	X		X	X										Per the client, the container ID should be 405B11F. CS 11/13/02
Trip Blank	11/12/02								X														

LAB:

AIRBILL No:

Courier:

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	11/12/02 1800				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	
John Spyke	11/12/02 1800	Maureen D. Bailey	11/13/02 9:00		

Temp: 5.6°C

Radford Army Ammunition Plant
Chain Of Custody Record

No 15 1004

Project Number	Project Name
07604-258	RFAAP

Project Contact (Name and Phone Number): Darren Rearick

Samplers: Brett Fisher, John Spangler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
403B12A	11/11/02 1420	5		X	9	E		8	X	X	X	X		X		X							
403B12B	11/11/02 1450	5		X	9	E	F	8	X	X	X			X		X							
403B12C	11/11/02 1515	5		X	9	E	F	8	X	X	X			X		X							
*715511	11/11/02 1445	5		X	9	E		8	X	X	X	X		X		X							*Received on all 4-8oz jars 1-4oz jar, & 3 encore
715512	11/11/02 1515	5		X	9	E		8	X	X	X	X		X		X							715B11. GFD 11-12-02
D-1	11/11/02	5		X	9	E		8	X	X	X	X		X		X							Per the client, 715B11 is the correct ID CS 11/12/02
Trip Blank	11/11/02								X														
																							Per John Spangler, analyze all soils for 8082 PCBs. CS 11/12/02

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	11/11/02 1800	[signature] GFD 11-12-02			
Relinquished by:	Date/time	Received by: (for lab) Vincent Daly	Date/Time 11/12/02 9:00	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 3.1°C

Radford Army Ammunition Plant
Chain Of Custody Record

No 51003

Project Number	Project Name
09604-258	RFAAP

Project Contact (Name and Phone Number): Darren Renner

Samplers: Brett Fisher Beth Carpenter

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
40554	11/11/02 900	5		X	9	E		8	X	X	X	X		X		X							
40555	11/11/02 1015	5		X	9	E		8	X	X	X	X		X		X							
715511	11/11/02 940	5		X	9	E		8	X	X	X	X		X		X							
40553	11/11/02 1120	5		X	9	E		8	X	X	X	X		X		X							
40552	11/11/02 1140	5		X	9	E		8	X	X	X	X		X		X							
40551	11/11/02 1200	5		X	9	E		8	X	X	X	X		X		X							
TripBlank	11/6/02							3	X	X													

Per John Spangler, analyze all soils for 8082 PCBs.
CS 11/12/02

Box #1			Box #2			Box #3	Box #4	
1. Surface Water	6. Trip Blank		A. HCl + Ice	F. Ice Only		F. Filtered	R. Rush - 3 Day	
2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other _____		U. Unfiltered	S. Standard 28 Day	
3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice			T. Timely 14 Day	
4. Rinsate	9. Other Surface Soil		D. H2SO4 + Ice	I. ZnAc + NaOH + Ice			O. Other _____	
5. Soil Sediment/Sludge			E. Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	11/6/02 1700				
Relinquished by:	Date/time	Received by: (for lab) Laurene Daily	Date/Time 11-12-02 9:00	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 3.20C

COC # 1014

CompuChem
a division of Liberty Analytical Corporation

QUALITY ASSURANCE NOTICE

Client Dames & Moore / URS / CEC
Case # _____
Type of Analysis Semivolatile Organic Compounds, Polyaromatic Hydrocarbon TCL Pest, TCL Polychlorinated Bph Explosives, Metals
Receipt Date 11-14-02

For some organic and/or inorganic determinations temperature preservation at 4 degrees Celsius is required for environmental samples during shipment to the laboratory and prior to analysis. A temperature tolerance range is generally allowed. Temperature of a representative sample from the shipping container is taken and recorded by the receiving clerk at the time of sample receipt. This temperature is representative of all samples contained in the cooler. The EPA CLP program requires the laboratory make notification when the temperature exceeds 10 degrees Celsius. The State of North Carolina allows a range of 2-4.4° Celsius. Notification to other clients is either client or project dependent.

Samples that are hand delivered to the laboratory immediately after collection may not meet this criteria. In these cases, the samples shall be considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The temperature of this sample at the time of receipt was determined to be 1.1 °C.

A CompuChem customer service representative contacted the client. The client instructed the Receiving department to:

Hand Delivery/Received on ice ✓
Analyze - qualify with notice ✓
Dispose - client will resample _____

Supervisor Signature/ID _____ / _____ Date 11/14/02

QAN-R-3
020205

qanr3 – 2/5/02:dce

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: _____Q2788_Part 2_____ **Fraction:**_____PCBs_____

Lab: _CompuChem_____ **Project Name:** __Radford SWMU 40/71_____

Reviewer: _____AS_____ **Date:** _____February 10, 2003_____

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The RPDs between the two columns were greater than the QC limit (i.e., 40%) for all positive field sample results and these results were flagged "J,g".

Correctable Anomalies: None.

Comments: Due to the abundance of organic interference, samples 40SB8F and 40SB9F were run at dilutions. Therefore, the reporting limits were raised.

Sample 40SB8F was received in a cooler that was chilled to 1.1 degrees C, below the 2.0 degrees QC limit. No data qualifying action was taken since the samples were not frozen and the containers were intact.

Signed: Andria Samson

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12B

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 26 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/13/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/14/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	44	U
11104-28-2	Aroclor-1221	57	U
11141-16-5	Aroclor-1232	44	U
53469-21-9	Aroclor-1242	30	U
12672-29-6	Aroclor-1248	30	U
11097-69-1	Aroclor-1254	30	U
11096-82-5	Aroclor-1260	44	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB12C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 39 decanted: (Y/N) N Date Received: 11/12/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/13/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/14/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	53	U
11104-28-2	Aroclor-1221	70	U
11141-16-5	Aroclor-1232	53	U
53469-21-9	Aroclor-1242	37	U
12672-29-6	Aroclor-1248	37	U
11097-69-1	Aroclor-1254	37	U
11096-82-5	Aroclor-1260	53	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	82	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	82	U
53469-21-9	Aroclor-1242	57	U
12672-29-6	Aroclor-1248	57	U
11097-69-1	Aroclor-1254	230	P
11096-82-5	Aroclor-1260	82	U

J, J

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 23 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	42	U
11104-28-2	Aroclor-1221	55	U
11141-16-5	Aroclor-1232	42	U
53469-21-9	Aroclor-1242	29	U
12672-29-6	Aroclor-1248	29	U
11097-69-1	Aroclor-1254	29	U
11096-82-5	Aroclor-1260	42	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB9F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2788

Matrix: (soil/water) SOIL Lab Sample ID: Q2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	2000	U
11104-28-2	Aroclor-1221	2700	U
11141-16-5	Aroclor-1232	2000	U
53469-21-9	Aroclor-1242	17000	P
12672-29-6	Aroclor-1248	1400	U
11097-69-1	Aroclor-1254	1400	U
11096-82-5	Aroclor-1260	2000	U

J,g

DATA VALIDATION WORKSHEET

PCBs

Reviewer: AS
Date: 3/10/2003
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: Q2788
Test Name: PCB
Method No.: 8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?			
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?			
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?			
1.4	Do sample preservation, collection and storage condition meet method requirement?			
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?		X	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes: cooler at 1.1C

40SB12B
40SB12C
40SB8F
40SB9C
40SB9F

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?			
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).			
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .			

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		
3.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? 1016 & 1260 require a minimum of three peaks and five concentrations. The remaining arochlors are required to run one standard during calibration.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ±20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	✓		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			

Notes:

5.0 Surrogate Recovery

		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?		✓	
5.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.		✓	
5.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.4	If No in Section 5.3, are these sample(s) or method blank(s) reanalyzed?			✓
5.5	If No in Section 5.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
	1 out	high/low	No action	No action
	2 out	2 high same column	K	No action
		2 low same column	L, UL	No action
		mixed same column	J, UJ	No action
		2 high diff columns	J	Not applicable
		2 low diff columns	J, UJ	Not applicable
		mixed diff columns	Professional judgement	Not applicable
	3 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		2 high, 1 low	K (2 high)	J (1 low 2nd column)
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
		other mixed	J, UJ	Not applicable
	4 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		Mixed	J, UJ	Not applicable
	If any recovery is >0% and <10% then L(+)/R(-).			
	If any recovery is 0% then R(+/-).			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunctionwith other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 40SB9C

7.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)? Generally, no action is taken on the basis of field duplicate results. Only discussed in the DV report.			✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		✓	
9.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?		✓	

Notes: Due to high organic materials, 40SB8F and 40SB9F were run at dilutions.
Sulfur cleanup was performed on 40SB9F, 40SB9C, 40SB8F, MS/MSD, LCS, and MB.

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)			
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: _____R2788_____ **Fraction:_VOCs, SVOCs, Pest., PCBs, PAH,___ Explosives, Nitroglycerin, Metals _____**

Lab: _CompuChem_____ **Project Name: __Radford SWMU 40/71_____**

Reviewer: _____RA_____ **Date: _____February 3, 2003_____**

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the VOC analyses, the LCS analyzed on 11/22/02 displayed a percent recovery for 2-hexanone (51%) which was less than the lower QC limit (i.e., 52%). All associated sample results were non-detects and were flagged "R,l."

For the explosive analyses, the LCS recovery for 1,3,5-trinitrobenzene (48%) was less than the lower QC limit (i.e., 50%). All associated sample results were non-detects and were flagged "R,l."

For the PAH analyses, the extraction holding times were grossly exceeded for samples EQB-1RE and EQB-2RE. All associated sample results were non-detects and were flagged "R,h." The original sample results should be used for data interpretation purposes.

Minor Anomalies: For the VOC analyses, the method blank analyzed on 11/22/02 contained 1,2,4-trichlorobenzene at 2 ug/L. The method blank analyzed on 11/28/02 contained 1,1,2-trichloro-1,2,2-trifluoromethane at 4 ug/L and 1,2,4-trichlorobenzene at 1 ug/L. The method blank analyzed on 12/4/02 contained 1,1,2-trichloro-1,2,2-trifluoromethane at 0.6 ug/L, toluene at 0.5 ug/L, chlorobenzene at 0.2 ug/L, styrene at 0.2 ug/L, isopropyl benzene at 0.3 ug/L, 1,3-dichlorobenzene at 0.8 ug/L, 1,4-dichlorobenzene at 0.7 ug/L, 1,2,4-trichlorobenzene at 2 ug/L, and xylene at 0.5 ug/L. Positive results less than 5 times the blank concentration were flagged "B,z" in the associated samples. The method blank also contained laboratory artifacts. These results were crossed out by the reviewer in the associated samples.

The CCV analyzed on 12/4/02 at 0048 displayed %Ds greater than the control limit (i.e., 20%) with a positive bias for trichlorofluoromethane at 24.11% and with a negative bias for dichlorodifluoromethane at 21.89%, carbon disulfide at 34.76%, 2-butanone at 36.82%, 4-methyl-2-pentanone at 29.24%, 2-hexanone at

31.82%, 1,2-dibromo-3-chloropropane at 24.79%, and methyl acetate at 36.12%. Non-detects were flagged "UJ,c" in the associated samples for failures with a negative bias. The CCV analyzed on 11/22/02 at 0103 displayed %Ds greater than the control limit with a positive bias for chloroethane at 27.13% and trichlorofluoromethane at 21.91%. The CCV analyzed on 11/25/02 at 2139 displayed a %D greater than the control limit with a positive bias for 1,1,2,2-tetrachloroethane at 20.47%. The CCV analyzed on 11/26/02 at 0928 displayed %Ds greater than the control limit with a positive bias for 1,1-dichloroethene at 24.11% and carbon disulfide at 25.89%. All associated sample results were non-detects and no data qualifying action was required. The CCV analyzed on 11/28/02 at 0010 displayed %Ds greater than the control limit with a negative bias for dichlorodifluoromethane at 29.58%, chloromethane at 24.8%, and methyl acetate at 26.44%. Non-detects were flagged "UJ,c" in the associated samples.

Acetone exceeded the calibration range in several samples and was flagged "E" by the laboratory. These results were flagged "J,q." These samples were re-analyzed at different dilution factors with acceptable results. Results from the dilution analyses should be used for this compound.

For the SVOC analyses, the method blank analyzed on 11/21/02 contained bis(2-ethylhexyl)phthalate at 2 ug/L. No positive results were reported and no data qualifying action was required.

The initial calibration analyzed on 11/7/02 displayed %RSDs greater than the control limit (i.e., 15%) for benzaldehyde at 17.8%, bis(2-chloroethyl)ether at 17.9%, 2,2-oxybis(1-chloropropane) at 28.3%, 4-methylphenol at 21.1%, n-nitroso-di-n-propylamine at 17.5%, hexachloroethane at 17.7%, naphthalene at 15.3%, 4-chloro-3-methylphenol at 15.3%, 2-methylnaphthalene at 16.1%, 2,4,5-trichlorophenol at 15.2%, dimethylphthalate at 15.8%, acenaphthylene at 22.2%, acenaphthene at 24.4%, dibenzofuran at 20.9%, fluorene at 18.6%, 4,6-dinitro-2-methylphenol at 17.3%, n-nitrosodiphenylamine at 24.9%, 4-bromophenyl-phenylether at 15.8%, atrazine at 57.9%, pentachlorophenol at 15.9%, phenanthrene at 16.2%, anthracene at 15.8%, carbazole at 15.5%, 3,3-dichlorobenzidine at 16.4%, chrysene at 16.5%, benzo(k)fluoranthene at 23.6%, and dibenzo(a,h)anthracene at 16.9%. The initial calibration analyzed on 11/25/02 displayed %RSDs greater than the control limit for benzaldehyde at 18.8%, 2,4-dimethylphenol at 17.4%, hexachlorocyclopentadiene at 17.6%, n-nitrosodiphenylamine at 15.8%, and atrazine at 69.7%. All associated sample results were non-detects and the only failures that were serious enough (i.e., >50%) to affect the non-detects were for atrazine. Atrazine non-detects were flagged "UJ,r" in the associated samples.

The CCV analyzed on 11/22/02 at 1019 displayed a %D greater than the control limit with a negative bias for atrazine at 35.81% and with positive bias for

hexachlorocyclopentadiene at 35.6%, 2,4-dinitrophenol at 25.6%, 4-chlorophenyl-phenylether at 22.6%, and 4,6-dinitro-2-methylphenol at 22.45%. Atrazine non-detects were previously flagged due to initial calibration failure and no further data qualifying action was required. All associated sample results were non-detects for the other compounds and no data qualifying action was required. The CCV analyzed on 11/25/02 at 2041 displayed %Ds greater than the control limit with a negative bias for 4-chlorophenyl-phenylether at 21.6% and atrazine at 52.1%. All associated sample results were non-detects and were flagged "UJ,c" unless previously flagged due to other anomalies. The CCV analyzed on 12/3/02 at 0818 displayed %Ds greater than the control limit with a negative bias for hexachlorocyclopentadiene at 22.2%, 2,4-dinitrophenol at 22.9%, 4-chlorophenyl-phenylether at 22.9%, atrazine at 44.8%, dibenzo(a,h)anthracene at 33.9%, and benzo(g,h,i)perylene at 34.7%, and with a positive bias for 2,2-oxybis(1-chloropropane) at 25.8%. All associated sample results were non-detects. Non-detects were flagged "UJ,c" for failures with a negative bias unless previously flagged due to other anomalies.

The LCS recoveries were greater than the upper QC limit for 2,4-dichlorophenol (120%), 4-chloro-3-methylphenol (132%/ 164%), 2,4,6-trichlorophenol (130%), 3-nitroaniline (110%), n-nitrosodiphenylamine (115%), 4-bromophenyl-phenylether (113%), pentachlorophenol (177%), benzo(k)fluoranthene (110%), benzo(a)pyrene (110%), acenaphthylene (114%), 3-nitroaniline (107%), acenaphthene (120%), dibenzofuran (105%), diethylphthalate (107%), 4-nitroaniline (116%), and atrazine (160%). All associated sample results were non-detects and no data qualifying action was required.

For the pesticides/PCB analyses, the method blank extracted on 11/20/02 contained beta-BHC at 0.043 ug/L and heptachlor at 0.041 ug/L. All associated sample results were non-detects and no data qualifying action was required.

The CCV analyzed on 11/19/02 displayed %Ds greater than the control limit (i.e., 15%) with a positive bias for 4,4-DDT (40.9%/49.9%). The CCVs analyzed on 12/18/02 displayed %Ds greater than the control limit with a positive bias for endrin aldehyde (15.4%/18.2%) and endrin (17.8%). All associated sample results were non-detects and no data qualifying action was required.

The LCS recovery was greater than the upper QC limit for 4,4-DDT at 180%. All associated sample results were non-detects and no data qualifying action was required.

For the PAH analyses, samples EQB-3RE, EQB-4RE, and EQB-5RE were re-extracted outside the holding time by 5, 6, or 7 days. All associated sample results were non-detects and were flagged "UJ,h." The original sample results should be used for data interpretation purposes. These samples were re-extracted since they

were associated with a method blank, extracted on 11/19/02, that displayed positive results for all compounds except phenanthrene. The method blank extracted on 11/20/02 displayed a positive result for chrysene at 0.073 ug/L. Positive results less than 5 times the blank concentration were flagged "B,z" in the associated samples.

The CCV analyzed on 11/27/02 at 0915 displayed %Ds greater than the control limit (i.e., 15%) with a positive bias for dibenzo(a,h)anthracene at 15.6% and benzo(g,h,i)perylene at 16.0%. The CCV analyzed on 11/27/02 at 1914 displayed %Ds greater than the control limit with a positive bias for fluorene at 18.3%. The CCV analyzed on 11/29/02 at 1800 displayed %Ds greater than the control limit with a positive bias for naphthalene at 18.1%, dibenzo(a,h)anthracene at 15.4%, and benzo(g,h,i)perylene at 20.2%. The CCV analyzed on 11/30/02 at 0113 displayed %Ds greater than the control limit with a positive bias for naphthalene at 15.1%, fluoranthene at 15.3%, dibenzo(a,h)anthracene at 15.2%, and benzo(g,h,i)perylene at 19.7%. The CCV analyzed on 12/01/02 at 1803 displayed %Ds greater than the control limit with a positive bias for dibenzo(a,h)anthracene at 16.6%, benzo(g,h,i)perylene at 16.2%, and benzo(a)anthracene at 16.9%. The CCV analyzed on 12/02/02 at 0114 displayed %Ds greater than the control limit with a positive bias for pyrene at 16.1%, benzo(a)anthracene at 17.7%, and benzo(a)pyrene at 19.7%. All associated sample results were non-detects except for pyrene. Pyrene results were previously flagged due to method blank contamination. No further data qualifying action was required.

The RPD between the two columns was greater than the QC limit (i.e., 40%) for pyrene in sample EQB-4. This result was previously flagged for method blank contamination. No further data qualifying action was required.

For the explosives analyses, the initial calibration analyzed on 12/3/02 displayed a %RSD greater than the QC limit (i.e., 20%) for RDX at 51.7%. All associated sample results were non-detects and were flagged "UJ,r". The continuing calibration analyzed on 11/20/02 at 2157 displayed a %D greater than the QC limit (i.e., 15%) with a positive bias for 4-amino-2,6-dinitrotoluene at 19.2%. The continuing calibration analyzed on 11/21/02 at 0714 displayed %Ds greater than the QC limit with a positive bias for 1,3-dinitrobenzene at 16.0% and 4-amino-2,6-dinitrotoluene at 19.0%. All associated sample results were non-detects and no data qualifying action was required. The continuing calibration analyzed on 11/21/02 at 1439 displayed a %D greater than the QC limit with a negative bias for 2,4,6-trinitrotoluene at 19.3%. The continuing calibration analyzed on 12/3/02 at 0612 displayed a %D greater than the QC limit with a negative bias for RDX at 30.2%. The continuing calibration analyzed on 12/3/02 at 1529 displayed a %D greater than the QC limit with a negative bias for RDX at 26.9%, and with a positive bias for HMX at 27.0% and 2,4,6-trinitrotoluene at 20.9%. The continuing calibration analyzed on 12/13/02 at 1419 displayed %Ds greater than

the QC limit with a negative bias for RDX at 21.9% and 3-nitrotoluene at 21.4% and with a positive bias for 1,3-dinitrobenzene at 19.2%. The continuing calibration analyzed on 12/13/02 at 2057 displayed %Ds greater than the QC limit with a negative bias for RDX at 27.3% and 3-nitrotoluene at 22.5% and with a positive bias for 1,3-dinitrobenzene at 23.7%. All associated sample results were non-detects and the failures associated with a negative bias were flagged "UJ,c" unless previously flagged due to other anomalies.

The recovery for surrogate 1,4-dinitrobenzene in sample EQB-6 (34%/34%) were less than the lower QC limit. All associated sample results were non-detects and were flagged "UL,s" unless previously flagged due to other anomalies.

For the nitroglycerin analyses, the recovery for surrogate 1,4-dinitrobenzene were less than the lower QC limit (i.e., 50%) in sample EQB-6 (37%/34%). The associated sample result was a non-detect and was flagged "UL,s."

For the metal analyses, the initial CRDL percent recoveries for aluminum (127.9%), antimony (110.8%), calcium (88.8%), copper (83.8%), lead (82%), nickel (111.2%), potassium (65.2%), selenium (152.8%), silver (145%), and zinc (70.3%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "L,w" and non-detects were flagged "UL,w" for calcium, copper, lead, potassium, and zinc in the associated samples. Positive nickel results less than 2xCRDL were flagged "K,w" in the associated samples. Positive aluminum and silver results were previously flagged due to calibration blank contamination and no further data qualifying action was required. No positive results were reported for antimony and selenium, thus, no data qualifying action was required.

The method blanks contained negative results for calcium and zinc and a positive result for silver. All associated sample results were previously flagged due to CRDL anomalies and no further data qualifying action was required.

The initial and continuing calibration blanks also contained positive results for aluminum, antimony, barium, magnesium, beryllium, copper, thallium, and silver and negative results for calcium and zinc. Positive results less than 5 times the blank concentration were flagged "B,o" in the associated samples.

Correctable Anomalies: None.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were raised.

It should be noted that TIC results were flagged "NJ,t" in the associated samples. Except for data flagged "R", all data, as qualified, are usable for their intended purpose based on the data reviewed.

Signed: Ranjan

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-3B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	1200	E J,B C
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	12	J
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U R,Q
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-3B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-3B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	109-99-9	FURAN, TETRAHYDRO-	9.58	8.64	NJ NJ
2.		~~LABORATORY ARTIFACT~~	~~16.23~~	~~35.89~~	~~JB~~
3.		~~LABORATORY ARTIFACT~~	~~17.42~~	~~11.92~~	~~J NJ~~
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-1DL

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-3B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
75-71-8	Dichlorodifluoromethane	25	U
74-87-3	Chloromethane	25	U
75-01-4	Vinyl Chloride	25	U
74-83-9	Bromomethane	25	U
75-00-3	Chloroethane	25	U
75-69-4	Trichlorofluoromethane	25	U
75-35-4	1,1-Dichloroethene	25	U
75-15-0	Carbon disulfide	25	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	890	D
67-64-1	Acetone	25	U
75-09-2	Methylene Chloride	25	U
156-60-5	trans-1,2-Dichloroethene	25	U
1634-04-4	Methyl-tert-butyl ether	25	U
75-34-3	1,1-Dichloroethane	25	U
156-59-2	cis-1,2-Dichloroethene	63	U
78-93-3	2-butanone	25	U
67-66-3	Chloroform	25	U
71-55-6	1,1,1-Trichloroethane	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
78-87-5	1,2-Dichloropropane	25	U
75-27-4	Bromodichloromethane	25	U
10061-01-5	cis-1,3-Dichloropropene	63	U
108-10-1	4-Methyl-2-pentanone	6	DJ
108-88-3	Toluene	25	U
10061-02-6	trans-1,3-Dichloropropene	25	U
79-00-5	1,1,2-Trichloroethane	25	U
127-18-4	Tetrachloroethene	63	U
591-78-6	2-hexanone	25	U
124-48-1	Dibromochloromethane	25	U
106-93-4	1,2-Dibromoethane		

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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-1DL

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-3B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	25	U
100-41-4	Ethylbenzene	25	U
100-42-5	Styrene	25	U
75-25-2	Bromoform	25	U
98-82-8	Isopropyl Benzene	25	U
79-34-5	1,1,2,2-Tetrachloroethane	25	U
541-73-1	1,3-Dichlorobenzene	25	U
106-46-7	1,4-Dichlorobenzene	6	DJ
95-50-1	1,2-Dichlorobenzene	25	U
96-12-8	1,2-Dibromo-3-Chloropropane	25	U
120-82-1	1,2,4-Trichlorobenzene	6	DJ
1330-20-7	Xylene (total)	25	U
79-20-9	Methyl acetate	25	U
110-82-7	Cyclohexane	25	U
108-87-2	Methylcyclohexane	25	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-1DL

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-3B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~541-05-9~~	~~CYCLOTRISILOXANE, HEXAMETHYL~~	12.94	~~47.82~~	NJD
2.	110-57-6	2-BUTENE, 1,4-DICHLORO-, (E)	15.06	34.59	NJD
3.		~~LABORATORY ARTIFACT~~	~~16.23~~	~~1066~~	~~JBD~~
4.		~~LABORATORY ARTIFACT~~	~~17.41~~	~~487.9~~	~~JBD~~
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-4B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	1300	E J,Q C
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	12	J
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U R,Q
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-4B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
EQB-2

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-4B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	109-99-9	FURAN, TETRAHYDRO-	9.57	8.99	NJ
2.		~~LABORATORY ARTIFACT~~	16.22	23.46	~~JB~~
3.		~~LABORATORY ARTIFACT~~	17.41	6.36	~~JNJ~~
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-2DL

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-4B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	25	U
74-87-3	Chloromethane	25	U
75-01-4	Vinyl Chloride	25	U
74-83-9	Bromomethane	25	U
75-00-3	Chloroethane	25	U
75-69-4	Trichlorofluoromethane	25	U
75-35-4	1,1-Dichloroethene	25	U
75-15-0	Carbon disulfide	25	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	25	U
67-64-1	Acetone	990	D
75-09-2	Methylene Chloride	9	DJ
156-60-5	trans-1,2-Dichloroethene	25	U
1634-04-4	Methyl-tert-butyl ether	25	U
75-34-3	1,1-Dichloroethane	25	U
156-59-2	cis-1,2-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	25	U
71-55-6	1,1,1-Trichloroethane	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
78-87-5	1,2-Dichloropropane	25	U
75-27-4	Bromodichloromethane	25	U
10061-01-5	cis-1,3-Dichloropropene	25	U
108-10-1	4-Methyl-2-pentanone	63	U
108-88-3	Toluene	6	DJ
10061-02-6	trans-1,3-Dichloropropene	25	U
79-00-5	1,1,2-Trichloroethane	25	U
127-18-4	Tetrachloroethene	25	U
591-78-6	2-hexanone	63	U
124-48-1	Dibromochloromethane	25	U
106-93-4	1,2-Dibromoethane	25	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-2DL

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-4B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	25	U
100-41-4	Ethylbenzene	25	U
100-42-5	Styrene	25	U
75-25-2	Bromoform	25	U
98-82-8	Isopropyl Benzene	25	U
79-34-5	1,1,2,2-Tetrachloroethane	25	U
541-73-1	1,3-Dichlorobenzene	25	U
106-46-7	1,4-Dichlorobenzene	25	U
95-50-1	1,2-Dichlorobenzene	25	U
96-12-8	1,2-Dibromo-3-Chloropropane	25	U
120-82-1	1,2,4-Trichlorobenzene	25	U
1330-20-7	Xylene (total)	25	U
79-20-9	Methyl acetate	25	U
110-82-7	Cyclohexane	25	U
108-87-2	Methylcyclohexane	25	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-2DL

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-4B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~541-05-9~~	~~CYCLOTRISILOXANE, HEXAMETHYL~~	~~12.93~~	~~34.69~~	~~NJD~~
2.	764-41-0	2-BUTENE, 1,4-DICHLORO-	15.05	26.25	NJD
3.		~~LABORATORY ARTIFACT~~	~~16.22~~	~~819.9~~	~~JBD~~
4.		~~LABORATORY ARTIFACT~~	~~17.41~~	~~190.1~~	~~JBD~~
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-6A52

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	3	J
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane		

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-6A52

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	0.8	J
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-6A52

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-8A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	3	J
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane		

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-8A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-8A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-10B52

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	UUJ,C
74-87-3	Chloromethane	5	UUJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	2	JB B,Z
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-10B52

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	0.9	JB B,Z
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	UJ J,C
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-10B52

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-12B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,Z
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	4	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-12B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79 34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	UJ,C
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-12B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-14B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	2	JB B,H
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	5	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	4	J
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane		

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-14B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	UUJ,C
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-14B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-16B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	UUJ,C
74-87-3	Chloromethane	5	UUJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,Z
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-16B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-16B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Number TICs found: 0

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB1003

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-1B52

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	5	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	1	J
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane		

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
TB1003

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-1B52

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TB1003

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-1B52

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	541-05-9	CYCLOTRISILOXANE, HEXAMETHYL	12.93	5.21	NJ
2.		~~LABORATORY ARTIFACT~~	~~16.22~~	~~33.16~~	~~JB~~
3.		~~LABORATORY ARTIFACT~~	~~17.40~~	~~5.15~~	~~J~~
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB1004

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-2

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-2B52

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB1004

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-2

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-2B52

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TB1004

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-2

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-2B52

Level: (low/med) LOW Date Received: 11/12/02

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~16.22~~	~~35.08~~	~~JB~~
2.		~~LABORATORY ARTIFACT~~	17.40	~~10.91~~	~~J N~~
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-9

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-9A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	3	J
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	2	J
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane		

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-9

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-9A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TRIPBLANK

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-9

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-9A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1010

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-5

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-5B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1010

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-5

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-5B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
108-90-7	Chlorobenzene		5	U
100-41-4	Ethylbenzene		5	U
100-42-5	Styrene		5	U
75-25-2	Bromoform		5	U
98-82-8	Isopropyl Benzene		5	U
79-34-5	1,1,2,2-Tetrachloroethane		5	U
541-73-1	1,3-Dichlorobenzene		5	U
106-46-7	1,4-Dichlorobenzene		5	U
95-50-1	1,2-Dichlorobenzene		5	U
96-12-8	1,2-Dibromo-3-Chloropropane		5	U
120-82-1	1,2,4-Trichlorobenzene		5	U
1330-20-7	Xylene (total)		5	U
79-20-9	Methyl acetate		5	U
110-82-7	Cyclohexane		5	U
108-87-2	Methylcyclohexane		5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TRIPBLANK1010

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-5

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-5B52

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	16.23	178.4	JB
2.		~~LABORATORY ARTIFACT~~	17.41	26.36	JB
3.					
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1016

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-7

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-7A52

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	3	J
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	1	J
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane		

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1016

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-7

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-7A52

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TRIPBLANK1016

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-7

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-7A52

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1020

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-11

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-11B52

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	2	JB B1
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	4	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1020

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-11

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-11B52

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	UJ,C
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TRIPBLANK1020

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-11

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-11B52

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1022

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-13

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-13B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
75-71-8	Dichlorodifluoromethane		5	UUJ,C
74-87-3	Chloromethane		5	UUJ,C
75-01-4	Vinyl Chloride		5	U
74-83-9	Bromomethane		5	U
75-00-3	Chloroethane		5	U
75-69-4	Trichlorofluoromethane		5	U
75-35-4	1,1-Dichloroethene		5	U
75-15-0	Carbon disulfide		5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu		1	JB B,Z
67-64-1	Acetone		13	U
75-09-2	Methylene Chloride		5	U
156-60-5	trans-1,2-Dichloroethene		5	U
1634-04-4	Methyl-tert-butyl ether		5	U
75-34-3	1,1-Dichloroethane		5	U
156-59-2	cis-1,2-Dichloroethene		5	U
78-93-3	2-butanone		13	U
67-66-3	Chloroform		5	U
71-55-6	1,1,1-Trichloroethane		5	U
56-23-5	Carbon Tetrachloride		5	U
71-43-2	Benzene		5	U
107-06-2	1,2-Dichloroethane		5	U
79-01-6	Trichloroethene		5	U
78-87-5	1,2-Dichloropropane		5	U
75-27-4	Bromodichloromethane		5	U
10061-01-5	cis-1,3-Dichloropropene		5	U
108-10-1	4-Methyl-2-pentanone		13	U
108-88-3	Toluene		3	J
10061-02-6	trans-1,3-Dichloropropene		5	U
79-00-5	1,1,2-Trichloroethane		5	U
127-18-4	Tetrachloroethene		5	U
591-78-6	2-hexanone		13	U
124-48-1	Dibromochloromethane		5	U
106-93-4	1,2-Dibromoethane		5	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1022

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-13

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-13B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U UJ,C
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
TRIPBLANK1022

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-13

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-13B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1027

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-18

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-18B52

Level: (low/med) LOW Date Received: 11/22/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	2	JB B,Z
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1027

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-18

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-18B52

Level: (low/med) LOW Date Received: 11/22/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	UUJ,C
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TRIPBLANK1027

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-18

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-18B52

Level: (low/med) LOW Date Received: 11/22/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1030

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-19

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-19B52

Level: (low/med) LOW Date Received: 11/25/02

% Moisture: not dec. _____ Date Analyzed: 12/04/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U UJ,C
75-15-0	Carbon disulfide	0.6	JB B,Z
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	2	JB B,Z
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	13	U UJ,C
78-93-3	2-butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	13	U UJ,C
108-10-1	4-Methyl-2-pentanone	0.9	JB B,Z
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	13	U UJ,C
591-78-6	2-hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane		

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1030

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-19

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-19B52

Level: (low/med) LOW Date Received: 11/25/02

% Moisture: not dec. _____ Date Analyzed: 12/04/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	0.2	JB B,Z
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	0.4	JB B,Z
106-46-7	1,4-Dichlorobenzene	0.4	JB
95-50-1	1,2-Dichlorobenzene	0.2	JB
96-12-8	1,2-Dibromo-3-Chloropropane	5	U UJ,C
120-82-1	1,2,4-Trichlorobenzene	0.6	JB B,Z
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U UJ,C
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TRIPBLANK1030

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-19

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-19B52

Level: (low/med) LOW Date Received: 11/25/02

% Moisture: not dec. _____ Date Analyzed: 12/04/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Number TICs found: 1

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	16.21	5.26	~~J NJ~~ B
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1094

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-17

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-17B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	UUJ,C
74-87-3	Chloromethane	5	UUJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,Z
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1094

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-17

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-17B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U,C
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TRIPBLANK1094

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-17

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-17B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
TRIPBLANK1096

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-15

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-15B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,N
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1096

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-15

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-15B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	UUJ,C
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TRIPBLANK1096

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-15

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-15B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM I VOA-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-3RA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	21	
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-3RA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	20	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	UJ,r
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-3RA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	7.34	6	J
2.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-4RA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	22	
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-4RA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	20	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U UJ,Y
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-4RA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	7.33	6	J NJ
2.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-6RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-6RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	20	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	UUJ,r
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-6RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 975 (g/mL) ML Lab File ID: R2788-8A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	21	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	21	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 975 (g/mL) ML Lab File ID: R2788-8A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	51	U
100-02-7	4-Nitrophenol	21	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	21	U
534-52-1	4,6-Dinitro-2-methylphenol	21	U
86-30-6	N-Nitrosodiphenylamine (1)	21	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U UJ,r
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 975 (g/mL) ML Lab File ID: R2788-8A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-10A64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-10A64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	20	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U UJ,R
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-10A64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 925 (g/mL) ML Lab File ID: R2788-12A64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/21/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	11	U
108-95-2	Phenol	11	U
111-44-4	Bis(2-chloroethyl)ether	11	U
95-57-8	2-Chlorophenol	11	U
95-48-7	2-Methylphenol	11	U
108-60-1	2,2'-oxybis(1-Chloropropane)	11	U
98-86-2	Acetophenone	11	U
106-44-5	4-Methylphenol	11	U
621-64-7	N-Nitroso-di-N-propylamine	11	U
67-72-1	Hexachloroethane	11	U
98-95-3	Nitrobenzene	11	U
78-59-1	Isophorone	11	U
88-75-5	2-Nitrophenol	11	U
105-67-9	2,4-Dimethylphenol	11	U
111-91-1	Bis(2-chloroethoxy)methane	11	U
120-83-2	2,4-Dichlorophenol	11	U
91-20-3	Naphthalene	11	U
106-47-8	4-Chloroaniline	11	U
87-68-3	Hexachlorobutadiene	11	U
105-60-2	Caprolactam	11	U
59-50-7	4-Chloro-3-methylphenol	11	U
91-57-6	2-Methylnaphthalene	11	U
77-47-4	Hexachlorocyclopentadiene	11	U UJ,C
88-06-2	2,4,6-Trichlorophenol	11	U
95-95-4	2,4,5-Trichlorophenol	11	U
92-52-4	1,1'-Biphenyl	11	U
91-58-7	2-Chloronaphthalene	11	U
88-74-4	2-Nitroaniline	22	U
131-11-3	Dimethylphthalate	11	U
606-20-2	2,6-Dinitrotoluene	11	U
208-96-8	Acenaphthylene	11	U
99-09-2	3-Nitroaniline	22	U
83-32-9	Acenaphthene	11	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 925 (g/mL) ML Lab File ID: R2788-12A64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/21/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	54	U UJ/C
100-02-7	4-Nitrophenol	22	U ↓
121-14-2	2,4-Dinitrotoluene	11	U
132-64-9	Dibenzofuran	11	U
84-66-2	Diethylphthalate	11	U
7005-72-3	4-Chlorophenyl-phenylether	11	U UJ/C
86-73-7	Fluorene	11	U
100-01-6	4-Nitroaniline	22	U
534-52-1	4,6-Dinitro-2-methylphenol	22	U
86-30-6	N-Nitrosodiphenylamine (1)	11	U
101-55-3	4-Bromophenyl-phenylether	11	U
118-74-1	Hexachlorobenzene	11	U
1912-24-9	Atrazine	11	U UJ/C
87-86-5	Pentachlorophenol	11	U
85-01-8	Phenanthrene	11	U
120-12-7	Anthracene	11	U
86-74-8	Carbazole	11	U
84-74-2	Di-n-butylphthalate	11	U
206-44-0	Fluoranthene	11	U
129-00-0	Pyrene	11	U
85-68-7	Butylbenzylphthalate	11	U
91-94-1	3,3'-Dichlorobenzidine	11	U
117-81-7	bis(2-ethylhexyl)Phthalate	11	U
56-55-3	Benzo(a)anthracene	11	U
218-01-9	Chrysene	11	U
117-84-0	Di-n-octylphthalate	11	U
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U UJ/C
191-24-2	Benzo(g,h,i)perylene	11	U ↓

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 925 (g/mL) ML Lab File ID: R2788-12A64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/21/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1.~~		~~UNKNOWN (BC)~~	19.66	~~5~~ RA 11/5/03	~~JB~~
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-14A64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/21/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	UJ,C
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-14A64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/21/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U UJ,C
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U UJ,C
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U UJ,C
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U UJ,C
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-14A64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/21/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-16B64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-16B64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U UJ/C
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U UJ/C
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-16B64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM I SV-TIC

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/17/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.40	U
72-55-9	4,4'-DDE	0.20	U
50-29-3	4,4'-DDT	0.60	U
60-57-1	Dieldrin	0.20	U
959-98-8	Endosulfan I	0.20	U
33213-65-9	Endosulfan II	0.40	U
1031-07-8	Endosulfan sulfate	0.40	U
72-20-8	Endrin	0.40	U
7421-93-4	Endrin Aldehyde	0.40	U
76-44-8	Heptachlor	0.10	U
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.20	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/17/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.40	U
72-55-9	4,4'-DDE	0.20	U
50-29-3	4,4'-DDT	0.60	U
60-57-1	Dieldrin	0.20	U
959-98-8	Endosulfan I	0.20	U
33213-65-9	Endosulfan II	0.40	U
1031-07-8	Endosulfan sulfate	0.40	U
72-20-8	Endrin	0.40	U
7421-93-4	Endrin Aldehyde	0.40	U
76-44-8	Heptachlor	0.10	U
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.20	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/17/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.40	U
72-55-9	4,4'-DDE	0.20	U
50-29-3	4,4'-DDT	0.60	U
60-57-1	Dieldrin	0.20	U
959-98-8	Endosulfan I	0.20	U
33213-65-9	Endosulfan II	0.40	U
1031-07-8	Endosulfan sulfate	0.40	U
72-20-8	Endrin	0.40	U
7421-93-4	Endrin Aldehyde	0.40	U
76-44-8	Heptachlor	0.10	U
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.20	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 975.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/18/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.41	U
72-55-9	4,4'-DDE	0.21	U
50-29-3	4,4'-DDT	0.62	U
60-57-1	Dieldrin	0.21	U
959-98-8	Endosulfan I	0.21	U
33213-65-9	Endosulfan II	0.41	U
1031-07-8	Endosulfan sulfate	0.41	U
72-20-8	Endrin	0.41	U
7421-93-4	Endrin Aldehyde	0.41	U
76-44-8	Heptachlor	0.10	U
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.1	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.21	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/18/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.40	U
72-55-9	4,4'-DDE	0.20	U
50-29-3	4,4'-DDT	0.60	U
60-57-1	Dieldrin	0.20	U
959-98-8	Endosulfan I	0.20	U
33213-65-9	Endosulfan II	0.40	U
1031-07-8	Endosulfan sulfate	0.40	U
72-20-8	Endrin	0.40	U
7421-93-4	Endrin Aldehyde	0.40	U
76-44-8	Heptachlor	0.10	U
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.20	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/18/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.40	U
72-55-9	4,4'-DDE	0.20	U
50-29-3	4,4'-DDT	0.60	U
60-57-1	Dieldrin	0.20	U
959-98-8	Endosulfan I	0.20	U
33213-65-9	Endosulfan II	0.40	U
1031-07-8	Endosulfan sulfate	0.40	U
72-20-8	Endrin	0.40	U
7421-93-4	Endrin Aldehyde	0.40	U
76-44-8	Heptachlor	0.10	U
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.20	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 925.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.11	U
319-84-6	alpha-BHC	0.11	U
319-85-7	beta-BHC	0.11	U
319-86-8	delta-BHC	0.11	U
58-89-9	gamma-BHC (Lindane)	0.11	U
72-54-8	4,4'-DDD	0.43	U
72-55-9	4,4'-DDE	0.22	U
50-29-3	4,4'-DDT	0.65	U
60-57-1	Dieldrin	0.22	U
959-98-8	Endosulfan I	0.22	U
33213-65-9	Endosulfan II	0.43	U
1031-07-8	Endosulfan sulfate	0.43	U
72-20-8	Endrin	0.43	U
7421-93-4	Endrin Aldehyde	0.43	U
76-44-8	Heptachlor	0.11	U
1024-57-3	Heptachlor Epoxide	0.11	U
72-43-5	Methoxychlor	1.1	U
8001-35-2	Toxaphene	11	U
12674-11-2	Aroclor-1016	1.1	U
11104-28-2	Aroclor-1221	2.2	U
11141-16-5	Aroclor-1232	1.1	U
53469-21-9	Aroclor-1242	1.1	U
12672-29-6	Aroclor-1248	1.1	U
11097-69-1	Aroclor-1254	1.1	U
11096-82-5	Aroclor-1260	1.1	U
53494-70-5	Endrin Ketone	1.1	U
5103-74-2	gamma-Chlordane	0.11	U
5103-71-9	alpha-Chlordane	0.22	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/26/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.40	U
72-55-9	4,4'-DDE	0.20	U
50-29-3	4,4'-DDT	0.60	U
60-57-1	Dieldrin	0.20	U
959-98-8	Endosulfan I	0.20	U
33213-65-9	Endosulfan II	0.40	U
1031-07-8	Endosulfan sulfate	0.40	U
72-20-8	Endrin	0.40	U
7421-93-4	Endrin Aldehyde	0.40	U
76-44-8	Heptachlor	0.10	U
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.20	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/27/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-1RE

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/27/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 11/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

Do not use R4 11/29/02

R1h

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/27/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-2RE

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/27/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 11/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

DO NOT R4 R1 h

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/27/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-3RE

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/27/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 11/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

DO NOT USE PER 11/29/02

U1, h

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 925.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/27/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.4	U
83-32-9	Acenaphthene	1.4	U
86-73-7	Fluorene	1.4	U
129-00-0	Pyrene	4.9	PB B,Z
85-01-8	Phenanthrene	1.4	U
120-12-7	Anthracene	1.4	U
206-44-0	Fluoranthene	0.54	U
218-01-9	Chrysene	0.27	U
205-99-2	Benzo(b)fluoranthene	0.27	U
207-08-9	Benzo(k)fluoranthene	0.27	U
53-70-3	Dibenzo(a,h)anthracene	0.27	U
191-24-2	Benzo(g,h,i)perylene	0.27	U
56-55-3	Benzo(a)anthracene	0.27	U
50-32-8	Benzo(a)pyrene	0.27	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.27	U
208-96-8	Acenaphthylene	1.4	U

AMENDED DATA

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EQB-4RE

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/27/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 11/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

Do Not U/J PM

U/J h

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/27/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.25	JB B, E
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-5RE

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/27/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 11/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

Do Not U 1,2,4 RES

UJ/h

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 950.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/20/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/27/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.3	U
83-32-9	Acenaphthene	1.3	U
86-73-7	Fluorene	1.3	U
129-00-0	Pyrene	0.53	U
85-01-8	Phenanthrene	1.3	U
120-12-7	Anthracene	1.3	U
206-44-0	Fluoranthene	0.53	U
218-01-9	Chrysene	0.26	U
205-99-2	Benzo(b)fluoranthene	0.26	U
207-08-9	Benzo(k)fluoranthene	0.26	U
53-70-3	Dibenzo(a,h)anthracene	0.26	U
191-24-2	Benzo(g,h,i)perylene	0.26	U
56-55-3	Benzo(a)anthracene	0.26	U
50-32-8	Benzo(a)pyrene	0.26	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.26	U
208-96-8	Acenaphthylene	1.3	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/20/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/27/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 950.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/25/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	0.66	U
83-32-9	Acenaphthene	0.66	U
86-73-7	Fluorene	0.66	U
129-00-0	Pyrene	0.26	U
85-01-8	Phenanthrene	0.66	U
120-12-7	Anthracene	0.66	U
206-44-0	Fluoranthene	0.26	U
218-01-9	Chrysene	0.13	U
205-99-2	Benzo(b)fluoranthene	0.13	U
207-08-9	Benzo(k)fluoranthene	0.13	U
53-70-3	Dibenzo(a,h)anthracene	0.13	U
191-24-2	Benzo(g,h,i)perylene	0.13	U
56-55-3	Benzo(a)anthracene	0.13	U
50-32-8	Benzo(a)pyrene	0.13	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.13	U
208-96-8	Acenaphthylene	0.66	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 15000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	6.0	U
99-35-4	1,3,5-Trinitrobenzene	4.5	U R,X
121-82-4	RDX	4.5	U
99-65-0	1,3-Dinitrobenzene	4.5	U
118-96-7	2,4,6-Trinitrotoluene	4.5	U U,C
479-45-8	Tetryl	6.0	U
98-95-3	Nitrobenzene	4.5	U
121-14-2	2,4-Dinitrotoluene	4.5	U
606-20-2	2,6-Dinitrotoluene	6.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	6.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	6.0	U
88-72-2	2-Nitrotoluene	4.5	U
99-99-0	4-Nitrotoluene	4.5	U
99-08-1	3-Nitrotoluene	4.5	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/18/02

Concentrated Extract Volume: 8000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	3.20	U
99-35-4	1,3,5-Trinitrobenzene	2.40	U R,Q
121-82-4	RDX	2.40	U UJ,C
99-65-0	1,3-Dinitrobenzene	2.40	U
118-96-7	2,4,6-Trinitrotoluene	2.40	U
479-45-8	Tetryl	3.20	U
98-95-3	Nitrobenzene	2.40	U
121-14-2	2,4-Dinitrotoluene	2.40	U
606-20-2	2,6-Dinitrotoluene	3.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	3.20	U
1946-51-0	4-Amino-2,6-dinitrotoluene	3.20	U
88-72-2	2-Nitrotoluene	2.40	U
99-99-0	4-Nitrotoluene	2.40	U
99-08-1	3-Nitrotoluene	2.40	U UJ,C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 16000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	6.4	U
99-35-4	1,3,5-Trinitrobenzene	4.8	U
121-82-4	RDX	4.8	U
99-65-0	1,3-Dinitrobenzene	4.8	U
118-96-7	2,4,6-Trinitrotoluene	4.8	U
479-45-8	Tetryl	6.4	U
98-95-3	Nitrobenzene	4.8	U
121-14-2	2,4-Dinitrotoluene	4.8	U
606-20-2	2,6-Dinitrotoluene	6.4	U
35572-78-2	2-Amino-4,6-dinitrotoluene	6.4	U
1946-51-0	4-Amino-2,6-dinitrotoluene	6.4	U
88-72-2	2-Nitrotoluene	4.8	U
99-99-0	4-Nitrotoluene	4.8	U
99-08-1	3-Nitrotoluene	4.8	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 16000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R1 L
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U UJ1C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 20000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	8.0	U
99-35-4	1,3,5-Trinitrobenzene	6.0	U R1
121-82-4	RDX	6.0	U
99-65-0	1,3-Dinitrobenzene	6.0	U
118-96-7	2,4,6-Trinitrotoluene	6.0	U U1,C
479-45-8	Tetryl	8.0	U
98-95-3	Nitrobenzene	6.0	U
121-14-2	2,4-Dinitrotoluene	6.0	U
606-20-2	2,6-Dinitrotoluene	8.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	8.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	8.0	U
88-72-2	2-Nitrotoluene	6.0	U
99-99-0	4-Nitrotoluene	6.0	U
99-08-1	3-Nitrotoluene	6.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/22/02

Concentrated Extract Volume: 11000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	4.4	U UL,S
99-35-4	1,3,5-Trinitrobenzene	3.3	U R,L
121-82-4	RDX	3.3	U UJ,L
99-65-0	1,3-Dinitrobenzene	3.3	U UL,S
118-96-7	2,4,6-Trinitrotoluene	3.3	U
479-45-8	Tetryl	4.4	U
98-95-3	Nitrobenzene	3.3	U
121-14-2	2,4-Dinitrotoluene	3.3	U
606-20-2	2,6-Dinitrotoluene	4.4	U
35572-78-2	2-Amino-4,6-dinitrotoluene	4.4	U
1946-51-0	4-Amino-2,6-dinitrotoluene	4.4	U
88-72-2	2-Nitrotoluene	3.3	U
99-99-0	4-Nitrotoluene	3.3	U
99-08-1	3-Nitrotoluene	3.3	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/22/02

Concentrated Extract Volume: 11000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	4.4	U
99-35-4	1,3,5-Trinitrobenzene	3.3	U
121-82-4	RDX	3.3	U
99-65-0	1,3-Dinitrobenzene	3.3	U
118-96-7	2,4,6-Trinitrotoluene	3.3	U
479-45-8	Tetryl	4.4	U
98-95-3	Nitrobenzene	3.3	U
121-14-2	2,4-Dinitrotoluene	3.3	U
606-20-2	2,6-Dinitrotoluene	4.4	U
35572-78-2	2-Amino-4,6-dinitrotoluene	4.4	U
1946-51-0	4-Amino-2,6-dinitrotoluene	4.4	U
88-72-2	2-Nitrotoluene	3.3	U
99-99-0	4-Nitrotoluene	3.3	U
99-08-1	3-Nitrotoluene	3.3	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/22/02

Concentrated Extract Volume: 13000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	5.2	U
99-35-4	1,3,5-Trinitrobenzene	3.9	U
121-82-4	RDX	3.9	U
99-65-0	1,3-Dinitrobenzene	3.9	U
118-96-7	2,4,6-Trinitrotoluene	3.9	U
479-45-8	Tetryl	5.2	U
98-95-3	Nitrobenzene	3.9	U
121-14-2	2,4-Dinitrotoluene	3.9	U
606-20-2	2,6-Dinitrotoluene	5.2	U
35572-78-2	2-Amino-4,6-dinitrotoluene	5.2	U
1946-51-0	4-Amino-2,6-dinitrotoluene	5.2	U
88-72-2	2-Nitrotoluene	3.9	U
99-99-0	4-Nitrotoluene	3.9	U
99-08-1	3-Nitrotoluene	3.9	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 15000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	90	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/13/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 8000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	48	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-6

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 16000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	96	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 16000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	96	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/18/02

Concentrated Extract Volume: 20000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	120	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/22/02

Concentrated Extract Volume: 11000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
55-63-0	Nitroglycerin	66	U	UL/S

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/22/02

Concentrated Extract Volume: 11000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	66	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/22/02

Concentrated Extract Volume: 13000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	78	U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-3

Level (low/med): LOW Date Received: 11/13/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	1.0	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	1.3	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	12.5	U		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.41	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.1	U		P	UL,CV
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	3.0	B		P	B,O
7440-23-5	Sodium	887	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.99	B		P	
7440-66-6	Zinc	1.1	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-4

Level (low/med): LOW Date Received: 11/13/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.33	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	1.5	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	12.5	U		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.35	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.1	U		P	UL,W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.5	B		P	B,O
7440-23-5	Sodium	638	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-3

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-6

Level (low/med): LOW Date Received: 11/14/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.39	B		P	
7440-41-7	Beryllium	0.31	B		P	B,O
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	1.6	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	12.6	B		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	21.0	B		P	B,O
7439-96-5	Manganese	0.63	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.1	U		P	UL,W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.5	B		P	B,O
7440-23-5	Sodium	758	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.2	B		P	~~L,O~~ B,O

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-8

Level (low/med): LOW Date Received: 11/15/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.36	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL/W
7440-47-3	Chromium	0.84	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL/W
7439-89-6	Iron	12.5	U		P	
7439-92-1	Lead	1.2	U		P	UL/W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.53	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.1	U		P	UL/W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.7	B		P	B,O
7440-23-5	Sodium	529	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL/W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-10

Level (low/med): LOW Date Received: 11/16/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	80.4	B		P	B,O
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	3.1	B		P	
7440-41-7	Beryllium	0.21	B		P	B,O
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	1.8	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	12.5	U		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.46	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.1	U		P	UL,W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.5	B		P	B,O
7440-23-5	Sodium	699	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-12

Level (low/med): LOW Date Received: 11/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.30	U		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL,W
7440-47-3	Chromium	1.9	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	12.7	B		P	
7439-92-1	Lead	1.2	U		P	UL,W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.58	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.8	B		P	K,W
7440-09-7	Potassium	49.8	B		P	L,W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	3.0	B		P	B,O
7440-23-5	Sodium	833	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-14

Level (low/med): LOW Date Received: 11/20/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.32	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	ULIW
7440-47-3	Chromium	1.9	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.7	B		P	LIW
7439-89-6	Iron	13.3	B		P	
7439-92-1	Lead	1.2	U		P	ULIW
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.70	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	48.0	B		P	LIW
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.7	B		P	B,O
7440-23-5	Sodium	929	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	ULIW

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-16

Level (low/med): LOW Date Received: 11/21/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.33	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	ULIW
7440-47-3	Chromium	2.0	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	ULIW
7439-89-6	Iron	15.7	B		P	
7439-92-1	Lead	1.2	U		P	ULIW
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.61	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.7	B		P	LIW
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.7	B		P	B,O
7440-23-5	Sodium	1110	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	ULIW

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

DATA VALIDATION WORKSHEET

Volatile Organic Analysis by GC/MS

Reviewer: RA
Date: 11/4/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: R2788
Test Name: 8260B
Method No.: VOC

.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If the temperature of the cooler was elevated (> 10 °C) or bubble size in aqueous sample was too big (tiny bubble is OK.), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?			✓
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP? QAPP say - no HCl preservation.	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-): For aqueous unpreserved - 7 days for aromatic compounds All others - 14 days.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

collect	analyzed
11/11/02	11/22/02
11/12/02	11/22/02
11/13/02	11/26/02
11/14/02	"
11/15/19/02 11/20/02	11/25/02

.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per GCMS, 20 samples, batch, matrix, and level)?	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common volatile lab contaminants - methylene chloride, acetone, and 2-butanone) the amount in the associated blank.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If Yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the DV report.			✓

Notes: See attached- MBs also contained laboratory artifacts which were crossed off in the associated samples.

Pos → B, E

.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 15% and %D < ± 20%	✓	✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < CL? CL >0.10 for chloromethane, 1,1-dichloroethane, & bromoform or >0.30 for chlorobenzene & 1,1,2,2-tetrachloroethane. If yes, L(+)/R(-).		✓	

Notes: See attached

.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	✓		
5.2	Are BFB enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
5.3	Have all samples been analyzed within twelve hours of the BFB tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for BFB been met for each instrument used?	✓		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
	If any system monitoring compound(s) in the volatile fraction is out of specification, there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? DV report should indicate that extraction efficiency/ method accuracy cannot be verified.			✓

	1 or more <10%	1 high/low	2 or 3 high/low	2 or 3 all low	2 or 3 all high
Positives	L	J	J	L	K
Non-detects	R	UJ	UJ	UL	NONE

Note: The B qualifier remains over surrogate flagging.

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?			
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: VR LCS analyzed 11/22/02. 2-Hexanone 51% < 52-133%. and results → R, J

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

0.0 Field Duplicate		Yes	No	NA
10.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".	✓		

Notes: TIC → NJ, t
acetone exceeded in several samples "E" → J/q
use diluted results -

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 21			
12.1.2	Number of target compounds in each analysis: 48			
12.1.3	Number of results rejected and not reported: 2			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 99%			

Notes:

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO

VBLKRK

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: WG21337-2B52R88 Lab Sample ID: WG21337-2

Date Analyzed: 11/22/02 Time Analyzed: 0136

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

Instrument ID: F50052

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VRKLCS	WG21337-5	WG21337-5B52	0209
02	TB1003	R2788-1	R2788-1B52	0559
03	TB1004	R2788-2	R2788-2B52	0632
04	EQB-1	R2788-3	R2788-3B52	0705
05	EQB-2	R2788-4	R2788-4B52	0739
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKRK

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21337-2

Sample wt/vol: 5 (g/ml) ML Lab File ID: WG21337-2B52R88

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	2	J
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKRK

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21337-2

Sample wt/vol: 5 (g/ml) ML Lab File ID: WG21337-2B52R8

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/22/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		LABORATORY ARTIFACT	16.23	29.07	J
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FORM I VOA-TIC

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO

VBLKUN

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: WG21440-2B52R Lab Sample ID: WG21440-2

Date Analyzed: 11/25/02 Time Analyzed: 2322

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

Instrument ID: F50052

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VUNLCS	WG21440-5	WG21440-5B52	2357
02	EQB-1DL	R2788-3	R2788-3B52	0137
03	EQB-2DL	R2788-4	R2788-4B52	0207
04	TRIPBLANK101	R2788-5	R2788-5B52	0238
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKUN

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21440-2

Sample wt/vol: 5 (g/ml) ML Lab File ID: WG21440-2B52R

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/25/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Number TICs found: 3

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		LABORATORY ARTIFACT	12.93	5.95	J
2.		LABORATORY ARTIFACT	16.23	102.8	J
3.		LABORATORY ARTIFACT	17.41	28.08	J
4.					
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FORM I VOA-TIC

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO

VBLKXY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: WG21587-1A52 Lab Sample ID: WG21587-1

Date Analyzed: 11/26/02 Time Analyzed: 1010

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

Instrument ID: F50052

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VXYLCS	WG21587-4	WG21587-4A52	1042
02	EQB-3	R2788-6	R2788-6A52	1747
03	TRIPBLANK101	R2788-7	R2788-7A52	1817
04	EQB-4	R2788-8	R2788-8A52	1848
05	TRIPBLANK	R2788-9	R2788-9A52	1918
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKXY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21587-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: WG21587-1A52

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uI

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		LABORATORY ARTIFACT	16.25	100.7	J
2.		LABORATORY ARTIFACT	17.42	17.99	J
3.					
4.					
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FORM I VOA-TIC

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO

VBLKAF

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: WG21661-3B52R Lab Sample ID: WG21661-3

Date Analyzed: 11/28/02 Time Analyzed: 0041

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

Instrument ID: F50052

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VAFLCS	WG21661-8	WG21661-8B52	0111
02	EQB-5	R2776-10	R2788-10B52	0550
03	TRIPBLANK102	R2776-11	R2788-11B52	0621
04	EQB-6	R2776-12	R2788-12B52	0652
05	TRIPBLANK102	R2776-13	R2788-13B52	0722
06	EQB-7	R2776-14	R2788-14B52	0753
07	TRIPBLANK109	R2776-15	R2788-15B52	0824
08	EQB-8	R2776-16	R2788-16B52	0855
09	TRIPBLANK109	R2776-17	R2788-17B52	0926
10	TRIPBLANK102	R2776-18	R2788-18B52	0957
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKAF

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21661-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: WG21661-3B52R

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	4	J
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKAF

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21661-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: WG21661-3B52R

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	1	J
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE N

VBLKYQ

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: WG21593-1B52 Lab Sample ID: WG21593-1

Date Analyzed: 12/04/02 Time Analyzed: 0120

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

Instrument ID: F50052

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VYQLCS	WG21593-4	WG21593-4B52	0152
02	TRIPBLANK103	R2788-19	R2788-19B52	0827
03				
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKYQ

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21593-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: WG21593-1B52

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/04/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.6	J
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	0.5	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKYQ

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21593-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: WG21593-1B52

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/04/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	0.2	J
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	0.2	J
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	0.3	J
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	0.8	J
106-46-7	1,4-Dichlorobenzene	0.8	J
95-50-1	1,2-Dichlorobenzene	0.7	J
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	2	J
1330-20-7	Xylene (total)	0.5	J
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

3A
WATER VOLATILE LAB CONTROL SAMPLE

VRKLCS

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
1,1,2-Trichloroethane	50.00	52.49	105	73-127
Tetrachloroethene	50.00	51.87	104	79-131
2-hexanone	250.0	127.4	51*	52-133
Dibromochloromethane	50.00	54.09	108	82-127
1,2-Dibromoethane	50.00	53.87	108	50-150
Chlorobenzene	50.00	51.55	103	80-117
Ethylbenzene	50.00	52.77	106	82-117
Styrene	50.00	53.37	107	77-119
Bromoform	50.00	52.37	105	65-139
Isopropyl Benzene	50.00	52.20	104	50-150
1,1,2,2-Tetrachloroetha	50.00	54.77	110	55-141
1,3-Dichlorobenzene	50.00	51.79	104	50-150
1,4-Dichlorobenzene	50.00	48.71	97	50-150
1,2-Dichlorobenzene	50.00	48.89	98	50-150
1,2-Dibromo-3-Chloropro	50.00	51.27	102	50-150
1,2,4-Trichlorobenzene	50.00	44.38	89	50-150
Xylene (total)	150.0	155.4	104	78-118
Methyl acetate	50.00	49.55	99	50-150
Cyclohexane	50.00	51.06	102	50-150
Methylcyclohexane	50.00	52.30	105	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 1 out of 48 outside limits

COMMENTS: _____

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: BF021203B52 BFB Injection Date: 12/04/02

Instrument ID: F50052 BFB Injection Time: 0033

GC Column: DB624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.9
75	30.0 - 60.0% of mass 95	44.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	52.8
175	5.0 - 9.0% of mass 174	3.7 (6.9)1
176	95.0 - 101.0% of mass 174	51.4 (97.4)1
177	5.0 - 9.0% of mass 176	3.3 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	CS021203B52	12/04/02	0048
02	VBLKYQ	WG21593-1	WG21593-1B52	12/04/02	0120
03	VYQLCS	WG21593-4	WG21593-4B52	12/04/02	0152
04	TRIPBLANK103	R2788-19	R2788-19B52	12/04/02	0827
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FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: F50052 Calibration Date: 12/04/02 Time: 0048

Lab File ID: CS021203B52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

NO->UJ,C

GC Column: EQUITY624 ID: 0.53 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
Dichlorodifluoromethane	0.5020000	0.3920972	0.3920972	0.001	-21.89	90.00	AVRG	
Chloromethane	0.3250000	0.2845110	0.2845110	0.1	-12.46	90.00	AVRG	
Vinyl Chloride	0.3200000	0.3161541	0.3161541	0.001	-1.20	20.00	AVRG	
Bromomethane	0.3490000	0.3520351	0.3520351	0.001	0.87	90.00	AVRG	
Chloroethane	0.1800000	0.1993034	0.1993034	0.001	10.72	90.00	AVRG	
Trichlorofluoromethane	0.4800000	0.5957464	0.5957464	0.001	24.11	90.00	AVRG	
1,1-Dichloroethene	0.2680000	0.2157338	0.2157338	0.001	-19.50	20.00	AVRG	
Carbon disulfide	0.9180000	0.5989219	0.5989219	0.001	-34.76	90.00	AVRG	<-
1,1,2-trichloro-1,2,2-triflu	0.7630000	0.6505493	0.6505493	0.001	-14.74	90.00	AVRG	
Acetone	420.98581	625.00000	0.0269221	0.001	-32.64	90.00	2RDR	<-
Methylene Chloride	227.72450	250.00000	0.2876661	0.001	-8.91	90.00	2RDR	
trans-1,2-Dichloroethene	0.3150000	0.2961234	0.2961234	0.001	-5.99	90.00	AVRG	
Methyl-tert-butyl ether	0.5510000	0.4431446	0.4431446	0.001	-19.57	90.00	AVRG	
1,1-Dichloroethane	0.6460000	0.5877619	0.5877619	0.1	-9.02	90.00	AVRG	
cis-1,2-Dichloroethene	0.3300000	0.3236123	0.3236123	0.001	-1.94	90.00	AVRG	
2-butanone	0.0820000	0.0518093	0.0518093	0.001	-36.82	90.00	AVRG	
Chloroform	0.6020000	0.6643097	0.6643097	0.001	10.35	20.00	AVRG	
1,1,1-Trichloroethane	0.5000000	0.5522022	0.5522022	0.001	10.44	90.00	AVRG	
Carbon Tetrachloride	0.4830000	0.5440914	0.5440914	0.001	12.65	90.00	AVRG	
Benzene	0.9050000	0.8546452	0.8546452	0.001	-5.56	90.00	AVRG	
1,2-Dichloroethane	0.2940000	0.3115915	0.3115915	0.001	5.98	90.00	AVRG	
Trichloroethene	0.3580000	0.3449018	0.3449018	0.001	-3.66	90.00	AVRG	
1,2-Dichloropropane	0.4450000	0.4515294	0.4515294	0.001	1.47	20.00	AVRG	
Bromodichloromethane	0.5840000	0.6518575	0.6518575	0.001	11.62	90.00	AVRG	
cis-1,3-Dichloropropene	0.5040000	0.5086608	0.5086608	0.001	0.92	90.00	AVRG	
4-Methyl-2-pentanone	0.2930000	0.2073138	0.2073138	0.001	-29.24	90.00	AVRG	
Toluene	0.7950000	0.7690827	0.7690827	0.001	-3.26	20.00	AVRG	
trans-1,3-Dichloropropene	0.4890000	0.4855631	0.4855631	0.001	-0.70	90.00	AVRG	
1,1,2-Trichloroethane	0.3820000	0.3434198	0.3434198	0.001	-10.10	90.00	AVRG	
Tetrachloroethene	0.4160000	0.4061554	0.4061554	0.001	-2.37	90.00	AVRG	
2-hexanone	0.2040000	0.1390948	0.1390948	0.001	-31.82	90.00	AVRG	
Dibromochloromethane	0.6600000	0.6284850	0.6284850	0.001	-4.78	90.00	AVRG	
1,2-Dibromoethane	0.5340000	0.4752745	0.4752745	0.001	-11.00	90.00	AVRG	
Chlorobenzene	0.9770000	0.9593883	0.9593883	0.3	-1.80	90.00	AVRG	
Ethylbenzene	0.4760000	0.4888017	0.4888017	0.001	2.69	20.00	AVRG	
Styrene	0.8820000	0.9123770	0.9123770	0.001	3.44	90.00	AVRG	
Bromoform	0.4170000	0.3540766	0.3540766	0.1	-15.09	90.00	AVRG	
Isopropyl Benzene	1.5400000	1.6077311	1.6077311	0.001	4.40	90.00	AVRG	
1,1,2,2-Tetrachloroethane	1.3620000	1.1758641	1.1758641	0.3	-13.67	90.00	AVRG	
1,3-Dichlorobenzene	1.4900000	1.4810872	1.4810872	0.001	-0.60	90.00	AVRG	
1,4-Dichlorobenzene	1.6500000	1.7008691	1.7008691	0.001	3.08	90.00	AVRG	
1,2-Dichlorobenzene	1.3120000	1.2800006	1.2800006	0.001	-2.44	90.00	AVRG	

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: F50052 Calibration Date: 12/04/02 Time: 0048

Lab File ID: CS021203B52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

GC Column: EQUITY624 ID: 0.53 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dibromo-3-Chloropropane	0.2050000	0.1541795	0.1541795	0.001	-24.79	90.00	AVRG
1,2,4-Trichlorobenzene	0.7740000	0.7368589	0.7368589	0.001	-4.80	90.00	AVRG
Xylene (total)	0.5750000	0.5859207	0.5859207	0.001	1.90	90.00	AVRG
Methyl acetate	0.2600000	0.1660896	0.1660896	0.001	-36.12	90.00	AVRG
Cyclohexane	0.5620000	0.5084483	0.5084483	0.001	-9.53	90.00	AVRG
Methylcyclohexane	0.5140000	0.4987872	0.4987872	0.001	-2.96	90.00	AVRG
Dibromofluoromethane	0.6370000	0.5862884	0.5862884	0.001	-7.96	90.00	AVRG
1,2-Dichloroethane-d4	0.2630000	0.2523428	0.2523428	0.001	-4.05	90.00	AVRG
Toluene-d8	1.2490000	1.1289065	1.1289065	0.001	-9.62	90.00	AVRG
Bromofluorobenzene	1.8100000	1.4892871	1.4892871	0.001	-17.72	90.00	AVRG

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: BF021121B52 BFB Injection Date: 11/22/02

Instrument ID: F50052 BFB Injection Time: 0044

GC Column: DB624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.0
75	30.0 - 60.0% of mass 95	40.2
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	56.4
175	5.0 - 9.0% of mass 174	3.9 (6.9)1
176	95.0 - 101.0% of mass 174	55.2 (98.0)1
177	5.0 - 9.0% of mass 176	3.4 (6.2)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	CS021121B52	11/22/02	0103
02	VBLKRK	WG21337-2	WG21337-2B52R8	11/22/02	0136
03	VRKLCS	WG21337-5	WG21337-5B52R8	11/22/02	0209
04	TB1003	R2788-1	R2788-1B52	11/22/02	0559
05	TB1004	R2788-2	R2788-2B52	11/22/02	0632
06	EQB-1	R2788-3	R2788-3B52	11/22/02	0705
07	EQB-2	R2788-4	R2788-4B52	11/22/02	0739
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FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: F50052 Calibration Date: 11/22/02 Time: 0103

Lab File ID: CS021121B52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

all ND no flag

GC Column: EQUITY624 ID: 0.53 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.5020000	0.5954422	0.5954422	0.001	18.61	90.00	AVRG
Chloromethane	0.3250000	0.3096750	0.3096750	0.1	-4.72	90.00	AVRG
Vinyl Chloride	0.3200000	0.3690169	0.3690169	0.001	15.32	20.00	AVRG
Bromomethane	0.3490000	0.3867137	0.3867137	0.001	10.81	90.00	AVRG
Chloroethane ✓	0.1800000	0.2288424	0.2288424	0.001	27.13	90.00	AVRG
Trichlorofluoromethane ✓	0.4800000	0.5851814	0.5851814	0.001	21.91	90.00	AVRG
1,1-Dichloroethene	0.2680000	0.2922223	0.2922223	0.001	9.04	20.00	AVRG
Carbon disulfide	0.9180000	0.9251012	0.9251012	0.001	0.77	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	0.7630000	0.7953891	0.7953891	0.001	4.24	90.00	AVRG
Acetone ✓	630.91809	625.00000	0.0395417	0.001	0.95	90.00	2RDR
Methylene Chloride	273.73417	250.00000	0.3426337	0.001	9.49	90.00	2RDR
trans-1,2-Dichloroethene	0.3150000	0.3456756	0.3456756	0.001	9.74	90.00	AVRG
Methyl-tert-butyl ether	0.5510000	0.5243087	0.5243087	0.001	-4.84	90.00	AVRG
1,1-Dichloroethane	0.6460000	0.6947073	0.6947073	0.1	7.54	90.00	AVRG
cis-1,2-Dichloroethene	0.3300000	0.3619151	0.3619151	0.001	9.67	90.00	AVRG
2-butanone	0.0820000	0.0809207	0.0809207	0.001	-1.32	90.00	AVRG
Chloroform	0.6020000	0.6490775	0.6490775	0.001	7.82	20.00	AVRG
1,1,1-Trichloroethane	0.5000000	0.5457939	0.5457939	0.001	9.16	90.00	AVRG
Carbon Tetrachloride	0.4830000	0.5321911	0.5321911	0.001	10.18	90.00	AVRG
Benzene	0.9050000	0.9296768	0.9296768	0.001	2.73	90.00	AVRG
1,2-Dichloroethane	0.2940000	0.3137673	0.3137673	0.001	6.72	90.00	AVRG
Trichloroethene	0.3580000	0.3801931	0.3801931	0.001	6.20	90.00	AVRG
1,2-Dichloropropane	0.4450000	0.4680491	0.4680491	0.001	5.18	20.00	AVRG
Bromodichloromethane	0.5840000	0.6353408	0.6353408	0.001	8.79	90.00	AVRG
cis-1,3-Dichloropropene	0.5040000	0.5249342	0.5249342	0.001	4.15	90.00	AVRG
4-Methyl-2-pentanone	0.2930000	0.2901183	0.2901183	0.001	-0.98	90.00	AVRG
Toluene	0.7950000	0.7844567	0.7844567	0.001	-1.33	20.00	AVRG
trans-1,3-Dichloropropene	0.4890000	0.5056857	0.5056857	0.001	3.41	90.00	AVRG
1,1,2-Trichloroethane	0.3820000	0.4039391	0.4039391	0.001	5.74	90.00	AVRG
Tetrachloroethene	0.4160000	0.4308335	0.4308335	0.001	3.56	90.00	AVRG
2-hexanone	0.2040000	0.2053937	0.2053937	0.001	0.68	90.00	AVRG
Dibromochloromethane	0.6600000	0.6996560	0.6996560	0.001	6.01	90.00	AVRG
1,2-Dibromoethane	0.5340000	0.5508147	0.5508147	0.001	3.15	90.00	AVRG
Chlorobenzene	0.9770000	0.9881935	0.9881935	0.3	1.14	90.00	AVRG
Ethylbenzene	0.4760000	0.4995548	0.4995548	0.001	4.95	20.00	AVRG
Styrene	0.8820000	0.9316496	0.9316496	0.001	5.63	90.00	AVRG
Bromoform	0.4170000	0.4314548	0.4314548	0.1	3.47	90.00	AVRG
Isopropyl Benzene	1.5400000	1.5760372	1.5760372	0.001	2.34	90.00	AVRG
1,1,2,2-Tetrachloroethane	1.3620000	1.4605947	1.4605947	0.3	7.24	90.00	AVRG
1,3-Dichlorobenzene	1.4900000	1.5035267	1.5035267	0.001	0.91	90.00	AVRG
1,4-Dichlorobenzene	1.6500000	1.6987460	1.6987460	0.001	2.95	90.00	AVRG
1,2-Dichlorobenzene	1.3120000	1.3370377	1.3370377	0.001	1.91	90.00	AVRG

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: BF021125B52 BFB Injection Date: 11/25/02

Instrument ID: F50052 BFB Injection Time: 2121

GC Column: DB624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.7
75	30.0 - 60.0% of mass 95	42.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.1 (0.2)1
174	Greater than 50.0% of mass 95	53.6
175	5.0 - 9.0% of mass 174	3.7 (6.8)1
176	95.0 - 101.0% of mass 174	53.4 (99.7)1
177	5.0 - 9.0% of mass 176	3.5 (6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	CS021125B52	11/25/02	2139
02	VBLKUN	WG21440-2	WG21440-2B52R	11/25/02	2322
03	VUNLCS	WG21440-5	WG21440-5B52R	11/25/02	2357
04	EQB-1DL	R2788-3	R2788-3B52	11/26/02	0137
05	EQB-2DL	R2788-4	R2788-4B52	11/26/02	0207
06	TRIPBLANK101	R2788-5	R2788-5B52	11/26/02	0238
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FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: F50052 Calibration Date: 11/25/02 Time: 2139

Lab File ID: CS021125B52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

all ND no flag

GC Column: EQUITY624 ID: 0.53 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.5020000	0.5726882	0.5726882	0.001	14.08	90.00	AVRG
Chloromethane	0.3250000	0.3132776	0.3132776	0.1	-3.61	90.00	AVRG
Vinyl Chloride	0.3200000	0.3460385	0.3460385	0.001	8.14	20.00	AVRG
Bromomethane	0.3490000	0.3763545	0.3763545	0.001	7.84	90.00	AVRG
Chloroethane	0.1800000	0.2016189	0.2016189	0.001	12.01	90.00	AVRG
Trichlorofluoromethane	0.4800000	0.5339505	0.5339505	0.001	11.24	90.00	AVRG
1,1-Dichloroethene	0.2680000	0.3075760	0.3075760	0.001	14.77	20.00	AVRG
Carbon disulfide	0.9180000	1.0694689	1.0694689	0.001	16.50	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	0.7630000	0.8480502	0.8480502	0.001	11.15	90.00	AVRG
Acetone	655.93586	625.00000	0.0410247	0.001	4.95	90.00	2RDR
Methylene Chloride	275.84016	250.00000	0.3451411	0.001	10.34	90.00	2RDR
trans-1,2-Dichloroethene	0.3150000	0.3417218	0.3417218	0.001	8.48	90.00	AVRG
Methyl-tert-butyl ether	0.5510000	0.6150820	0.6150820	0.001	11.63	90.00	AVRG
1,1-Dichloroethane	0.6460000	0.7119369	0.7119369	0.1	10.21	90.00	AVRG
cis-1,2-Dichloroethene	0.3300000	0.3494899	0.3494899	0.001	5.91	90.00	AVRG
2-butanone	0.0820000	0.0858514	0.0858514	0.001	4.70	90.00	AVRG
Chloroform	0.6020000	0.6463508	0.6463508	0.001	7.37	20.00	AVRG
1,1,1-Trichloroethane	0.5000000	0.5417501	0.5417501	0.001	8.35	90.00	AVRG
Carbon Tetrachloride	0.4830000	0.5349208	0.5349208	0.001	10.75	90.00	AVRG
Benzene	0.9050000	0.9095820	0.9095820	0.001	0.51	90.00	AVRG
1,2-Dichloroethane	0.2940000	0.3380716	0.3380716	0.001	14.99	90.00	AVRG
Trichloroethene	0.3580000	0.3494765	0.3494765	0.001	-2.38	90.00	AVRG
1,2-Dichloropropane	0.4450000	0.4632162	0.4632162	0.001	4.09	20.00	AVRG
Bromodichloromethane	0.5840000	0.6390831	0.6390831	0.001	9.43	90.00	AVRG
cis-1,3-Dichloropropene	0.5040000	0.5246220	0.5246220	0.001	4.09	90.00	AVRG
4-Methyl-2-pentanone	0.2930000	0.3004216	0.3004216	0.001	2.53	90.00	AVRG
Toluene	0.7950000	0.7594135	0.7594135	0.001	-4.48	20.00	AVRG
trans-1,3-Dichloropropene	0.4890000	0.5295517	0.5295517	0.001	8.29	90.00	AVRG
1,1,2-Trichloroethane	0.3820000	0.3983994	0.3983994	0.001	4.29	90.00	AVRG
Tetrachloroethene	0.4160000	0.3948712	0.3948712	0.001	-5.08	90.00	AVRG
2-hexanone	0.2040000	0.2100654	0.2100654	0.001	2.97	90.00	AVRG
Dibromochloromethane	0.6600000	0.7020500	0.7020500	0.001	6.37	90.00	AVRG
1,2-Dibromoethane	0.5340000	0.5826125	0.5826125	0.001	9.10	90.00	AVRG
Chlorobenzene	0.9770000	0.9493194	0.9493194	0.3	-2.83	90.00	AVRG
Ethylbenzene	0.4760000	0.4682090	0.4682090	0.001	-1.64	20.00	AVRG
Styrene	0.8820000	0.8966933	0.8966933	0.001	1.66	90.00	AVRG
Bromoform	0.4170000	0.4409801	0.4409801	0.1	5.75	90.00	AVRG
Isopropyl Benzene	1.5400000	1.4850319	1.4850319	0.001	-3.57	90.00	AVRG
1,1,2,2-Tetrachloroethane	1.3620000	1.6407895	1.6407895	0.3	20.47	90.00	AVRG
1,3-Dichlorobenzene	1.4900000	1.3835322	1.3835322	0.001	-7.14	90.00	AVRG
1,4-Dichlorobenzene	1.6500000	1.5906837	1.5906837	0.001	-3.59	90.00	AVRG
1,2-Dichlorobenzene	1.3120000	1.2391352	1.2391352	0.001	-5.55	90.00	AVRG

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: BF021126A52 BFB Injection Date: 11/26/02

Instrument ID: F50052 BFB Injection Time: 0858

GC Column: DB624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	17.0
75	30.0 - 60.0% of mass 95	42.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.4
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	50.9
175	5.0 - 9.0% of mass 174	3.6 (7.1)1
176	95.0 - 101.0% of mass 174	50.8 (99.9)1
177	5.0 - 9.0% of mass 176	3.3 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	CS021126A52	11/26/02	0928
02	VBLKXY	WG21587-1	WG21587-1A52	11/26/02	1010
03	VXYLCS	WG21587-4	WG21587-4A52	11/26/02	1042
04	EQB-3	R2788-6	R2788-6A52	11/26/02	1747
05	TRIPBLANK101	R2788-7	R2788-7A52	11/26/02	1817
06	EQB-4	R2788-8	R2788-8A52	11/26/02	1848
07	TRIPBLANK	R2788-9	R2788-9A52	11/26/02	1918
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FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: F50052 Calibration Date: 11/26/02 Time: 0928

Lab File ID: CS021126A52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

GC Column: EQUITY624 ID: 0.53 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
Dichlorodifluoromethane	0.5020000	0.5575248	0.5575248	0.001	11.06	90.00	AVRG	
Chloromethane	0.3250000	0.3224780	0.3224780	0.1	-0.78	90.00	AVRG	
Vinyl Chloride	0.3200000	0.3497214	0.3497214	0.001	9.29	20.00	AVRG	
Bromomethane	0.3490000	0.3808898	0.3808898	0.001	9.14	90.00	AVRG	
Chloroethane	0.1800000	0.2106379	0.2106379	0.001	17.02	90.00	AVRG	
Trichlorofluoromethane	0.4800000	0.5670519	0.5670519	0.001	18.14	90.00	AVRG	
1,1-Dichloroethene	0.2680000	0.3326178	0.3326178	0.001	24.11	20.00	AVRG	<-
Carbon disulfide	0.9180000	1.1556728	1.1556728	0.001	25.89	90.00	AVRG	
1,1,2-trichloro-1,2,2-triflu	0.7630000	0.8993335	0.8993335	0.001	17.87	90.00	AVRG	
Acetone	744.24790	625.00000	0.0462253	0.001	19.08	90.00	2RDR	
Methylene Chloride	269.41200	250.00000	0.3374853	0.001	7.76	90.00	2RDR	
trans-1,2-Dichloroethene	0.3150000	0.3738693	0.3738693	0.001	18.69	90.00	AVRG	
Methyl-tert-butyl ether	0.5510000	0.5276059	0.5276059	0.001	-4.24	90.00	AVRG	
1,1-Dichloroethane	0.6460000	0.7431841	0.7431841	0.1	15.04	90.00	AVRG	
cis-1,2-Dichloroethene	0.3300000	0.3704012	0.3704012	0.001	12.24	90.00	AVRG	
2-butanone	0.0820000	0.0819386	0.0819386	0.001	-0.07	90.00	AVRG	
Chloroform	0.6020000	0.6787720	0.6787720	0.001	12.75	20.00	AVRG	
1,1,1-Trichloroethane	0.5000000	0.5875752	0.5875752	0.001	17.52	90.00	AVRG	
Carbon Tetrachloride	0.4830000	0.5771188	0.5771188	0.001	19.49	90.00	AVRG	
Benzene	0.9050000	0.9460000	0.9460000	0.001	4.53	90.00	AVRG	
1,2-Dichloroethane	0.2940000	0.3291581	0.3291581	0.001	11.96	90.00	AVRG	
Trichloroethene	0.3580000	0.3813962	0.3813962	0.001	6.54	90.00	AVRG	
1,2-Dichloropropane	0.4450000	0.4767366	0.4767366	0.001	7.13	20.00	AVRG	
Bromodichloromethane	0.5840000	0.6583532	0.6583532	0.001	12.73	90.00	AVRG	
cis-1,3-Dichloropropene	0.5040000	0.5342393	0.5342393	0.001	6.00	90.00	AVRG	
4-Methyl-2-pentanone	0.2930000	0.3047992	0.3047992	0.001	4.03	90.00	AVRG	
Toluene	0.7950000	0.8147886	0.8147886	0.001	2.49	20.00	AVRG	
trans-1,3-Dichloropropene	0.4890000	0.5366927	0.5366927	0.001	9.75	90.00	AVRG	
1,1,2-Trichloroethane	0.3820000	0.4012012	0.4012012	0.001	5.03	90.00	AVRG	
Tetrachloroethene	0.4160000	0.4471629	0.4471629	0.001	7.49	90.00	AVRG	
2-hexanone	0.2040000	0.2159684	0.2159684	0.001	5.87	90.00	AVRG	
Dibromochloromethane	0.6600000	0.7118082	0.7118082	0.001	7.85	90.00	AVRG	
1,2-Dibromoethane	0.5340000	0.5730111	0.5730111	0.001	7.30	90.00	AVRG	
Chlorobenzene	0.9770000	0.9967918	0.9967918	0.3	2.02	90.00	AVRG	
Ethylbenzene	0.4760000	0.5193114	0.5193114	0.001	9.10	20.00	AVRG	
Styrene	0.8820000	0.9516954	0.9516954	0.001	7.90	90.00	AVRG	
Bromoform	0.4170000	0.4398396	0.4398396	0.1	5.48	90.00	AVRG	
Isopropyl Benzene	1.5400000	1.6040801	1.6040801	0.001	4.16	90.00	AVRG	
1,1,2,2-Tetrachloroethane	1.3620000	1.4650996	1.4650996	0.3	7.57	90.00	AVRG	
1,3-Dichlorobenzene	1.4900000	1.5494790	1.5494790	0.001	3.99	90.00	AVRG	
1,4-Dichlorobenzene	1.6500000	1.6021966	1.6021966	0.001	-2.90	90.00	AVRG	
1,2-Dichlorobenzene	1.3120000	1.2583253	1.2583253	0.001	-4.09	90.00	AVRG	

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: BG021127B52 BFB Injection Date: 11/27/02

Instrument ID: F50052 BFB Injection Time: 2354

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.2
75	30.0 - 60.0% of mass 95	43.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	51.1
175	5.0 - 9.0% of mass 174	3.5 (6.9)1
176	95.0 - 101.0% of mass 174	50.0 (97.8)1
177	5.0 - 9.0% of mass 176	3.3 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	CS021127B52	11/28/02	0010
02	VBLKAF	WG21661-3	WG21661-3B52R	11/28/02	0041
03	VAFLCS	WG21661-8	WG21661-8B52R	11/28/02	0111
04	EQB-5	R2776-10	R2788-10B52	11/28/02	0550
05	TRIPBLANK102	R2776-11	R2788-11B52	11/28/02	0621
06	EQB-6	R2776-12	R2788-12B52	11/28/02	0652
07	TRIPBLANK102	R2776-13	R2788-13B52	11/28/02	0722
08	EQB-7	R2776-14	R2788-14B52	11/28/02	0753
09	TRIPBLANK109	R2776-15	R2788-15B52	11/28/02	0824
10	EQB-8	R2776-16	R2788-16B52	11/28/02	0855
11	TRIPBLANK109	R2776-17	R2788-17B52	11/28/02	0926
12	TRIPBLANK102	R2776-18	R2788-18B52	11/28/02	0957
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FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: F50052 Calibration Date: 11/28/02 Time: 0010

Lab File ID: CS021127B52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

GC Column: EQUITY624 ID: 0.53 (mm)

ND JC

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.5020000	0.3535054	0.3535054	0.001	-29.58	90.00	AVRG
Chloromethane	0.3250000	0.2443834	0.2443834	0.1	-24.80	90.00	AVRG
Vinyl Chloride	0.3200000	0.2823859	0.2823859	0.001	-11.75	20.00	AVRG
Bromomethane	0.3490000	0.3152597	0.3152597	0.001	-9.67	90.00	AVRG
Chloroethane	0.1800000	0.1812004	0.1812004	0.001	0.67	90.00	AVRG
Trichlorofluoromethane	0.4800000	0.5046823	0.5046823	0.001	5.14	90.00	AVRG
1,1-Dichloroethene	0.2680000	0.2952811	0.2952811	0.001	10.18	20.00	AVRG
Carbon disulfide	0.9180000	1.0307230	1.0307230	0.001	12.28	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	0.7630000	0.8438863	0.8438863	0.001	10.60	90.00	AVRG
Acetone	618.39934	625.00000	0.0387980	0.001	-1.06	90.00	2RDR
Methylene Chloride	256.41304	250.00000	0.3219824	0.001	2.56	90.00	2RDR
trans-1,2-Dichloroethene	0.3150000	0.3417739	0.3417739	0.001	8.50	90.00	AVRG
Methyl-tert-butyl ether	0.5510000	0.5350736	0.5350736	0.001	-2.89	90.00	AVRG
1,1-Dichloroethane	0.6460000	0.6616025	0.6616025	0.1	2.42	90.00	AVRG
cis-1,2-Dichloroethene	0.3300000	0.3446195	0.3446195	0.001	4.43	90.00	AVRG
2-butanone	0.0820000	0.0727909	0.0727909	0.001	-11.23	90.00	AVRG
Chloroform	0.6020000	0.6595521	0.6595521	0.001	9.56	20.00	AVRG
1,1,1-Trichloroethane	0.5000000	0.5670022	0.5670022	0.001	13.40	90.00	AVRG
Carbon Tetrachloride	0.4830000	0.5547854	0.5547854	0.001	14.86	90.00	AVRG
Benzene	0.9050000	0.8903472	0.8903472	0.001	-1.62	90.00	AVRG
1,2-Dichloroethane	0.2940000	0.3187010	0.3187010	0.001	8.40	90.00	AVRG
Trichloroethene	0.3580000	0.3501113	0.3501113	0.001	-2.20	90.00	AVRG
1,2-Dichloropropane	0.4450000	0.4523524	0.4523524	0.001	1.65	20.00	AVRG
Bromodichloromethane	0.5840000	0.6384370	0.6384370	0.001	9.32	90.00	AVRG
cis-1,3-Dichloropropene	0.5040000	0.5056600	0.5056600	0.001	0.33	90.00	AVRG
4-Methyl-2-pentanone	0.2930000	0.2606315	0.2606315	0.001	-11.05	90.00	AVRG
Toluene	0.7950000	0.8262439	0.8262439	0.001	3.93	20.00	AVRG
trans-1,3-Dichloropropene	0.4890000	0.5001787	0.5001787	0.001	2.29	90.00	AVRG
1,1,2-Trichloroethane	0.3820000	0.3571699	0.3571699	0.001	-6.50	90.00	AVRG
Tetrachloroethene	0.4160000	0.4024366	0.4024366	0.001	-3.26	90.00	AVRG
2-hexanone	0.2040000	0.1837470	0.1837470	0.001	-9.93	90.00	AVRG
Dibromochloromethane	0.6600000	0.6359059	0.6359059	0.001	-3.65	90.00	AVRG
1,2-Dibromoethane	0.5340000	0.5007005	0.5007005	0.001	-6.24	90.00	AVRG
Chlorobenzene	0.9770000	0.9273970	0.9273970	0.3	-5.08	90.00	AVRG
Ethylbenzene	0.4760000	0.4825525	0.4825525	0.001	1.38	20.00	AVRG
Styrene	0.8820000	0.8795373	0.8795373	0.001	-0.28	90.00	AVRG
Bromoform	0.4170000	0.3792924	0.3792924	0.1	-9.04	90.00	AVRG
Isopropyl Benzene	1.5400000	1.2640544	1.2640544	0.001	-17.92	90.00	AVRG
1,1,2,2-Tetrachloroethane	1.3620000	1.2785720	1.2785720	0.3	-6.12	90.00	AVRG
1,3-Dichlorobenzene	1.4900000	1.4489400	1.4489400	0.001	-2.76	90.00	AVRG
1,4-Dichlorobenzene	1.6500000	1.5884859	1.5884859	0.001	-3.73	90.00	AVRG
1,2-Dichlorobenzene	1.3120000	1.2027923	1.2027923	0.001	-8.32	90.00	AVRG

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: F50052 Calibration Date: 11/28/02 Time: 0010

Lab File ID: CS021127B52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

GC Column: EQUITY624 ID: 0.53 (mm)

COMPOUND	$\overline{RRF}$ or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dibromo-3-Chloropropane	0.2050000	0.1713910	0.1713910	0.001	-16.39	90.00	AVRG
1,2,4-Trichlorobenzene	0.7740000	0.7001915	0.7001915	0.001	-9.54	90.00	AVRG
Xylene (total)	0.5750000	0.5811909	0.5811909	0.001	1.08	90.00	AVRG
Methyl acetate	0.2600000	0.1912653	0.1912653	0.001	-26.44	90.00	AVRG
Cyclohexane	0.5620000	0.6084183	0.6084183	0.001	8.26	90.00	AVRG
Methylcyclohexane	0.5140000	0.5403776	0.5403776	0.001	5.13	90.00	AVRG
Dibromofluoromethane	0.6370000	0.6417963	0.6417963	0.001	0.75	90.00	AVRG
1,2-Dichloroethane-d4	0.2630000	0.2857280	0.2857280	0.001	8.64	90.00	AVRG
Toluene-d8	1.2490000	1.2498059	1.2498059	0.001	0.06	90.00	AVRG
Bromofluorobenzene	1.8100000	1.7001226	1.7001226	0.001	-6.07	90.00	AVRG

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 1/14/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: R2788
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?			✓
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		L	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		L	

Notes:

collected	extract	analyzed
11/12/02	11/19/02	11/22/02
11/13/02, 11/14/02	"	"
11/15/02	"	"
11/18/02, 11/19/02	11/21/02	12/3/02
11/20/02	11/25/02	11/26/02

11/26/01

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes: MB analyzed 11/2/02 bis(2-ethylhexyl)phthalate, 2 ug/L all ND in ars samples, no action-

EB in 4 MS SDG are ars. w/ samples in other SDGs.

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes: IC 11/7/02 atrazine 57.88% ND → UJ/V all ND for other failures - no flags

IC 11/25/02 " 69.74% ND " " " "

also see attached CC 11/22/02 atrazine -35.81 prev. all others pos. bias, ND, no flag

11/25/02 neg. bias NDs → UJ/C

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

	1 or more <10%	2 or 3 high/low	2 or 3 all low	2 or 3 all high
Positives	L	J	L	K
Non-detects	R	UJ	UL	NONE

Note: The B qualifier remains over surrogate flagging.

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?			
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: See attached
all LCS %R all ND, no action

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

0.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			✓

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness =_____			

Notes:

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO

SBLKVP

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Lab File ID: WG21455-1B64_R Lab Sample ID: WG21455-1

Instrument ID: 5972HP64 Date Extracted: 11/19/02

Matrix: (soil/water) WATER Date Analyzed: 11/21/02

Level: (low/med) LOW Time Analyzed: 0428

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SVPLCS	WG21455-2	WG21455-2B64	11/21/02
02	EQB-1	R2788-3	R2788-3RA64	11/22/02
03	EQB-2	R2788-4	R2788-4RA64	11/22/02
04	EQB-3	R2788-6	R2788-6RA64	11/22/02
05	EQB-4	R2788-8	R2788-8A64	11/22/02
06	EQB-5	R2788-10	R2788-10A64	11/22/02
07				
08				
09				
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLKVP

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21455-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: WG21455-1B64_R

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	20	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	2	J
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: 5972HP64 Calibration Date(s): 11/07/02 11/07/02

Column: ID: 0.00 (mm) Calibration Time(s): 1136 1432

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Benzaldehyde	AVRG	1.30274490	17.843	50.000
Phenol	AVRG	1.89772952	14.412	30.000
Bis(2-chloroethyl)ether	AVRG	1.70855836	17.883	50.000
2-Chlorophenol	AVRG	1.42767624	11.067	50.000
2-Methylphenol	AVRG	1.38385997	14.848	50.000
2,2'-oxybis(1-Chloropropane)	AVRG	2.26955619	28.290	50.000
Acetophenone	AVRG	2.24511262	11.534	50.000
4-Methylphenol	AVRG	1.31694907	21.060	50.000
N-Nitroso-di-N-propylamine	AVRG	1.02388610	17.495	50.000
Hexachloroethane	AVRG	0.65768903	17.691	50.000
Nitrobenzene	AVRG	0.49424158	12.840	50.000
Isophorone	AVRG	0.86333819	5.273	50.000
2-Nitrophenol	AVRG	0.22874976	4.131	30.000
2,4-Dimethylphenol	AVRG	0.29036084	10.350	50.000
Bis(2-chloroethoxy)methane	AVRG	0.51766496	14.117	50.000
2,4-Dichlorophenol	AVRG	0.30415530	9.875	30.000
Naphthalene	AVRG	1.00744559	15.336	50.000
4-Chloroaniline	AVRG	0.49164580	12.444	50.000
Hexachlorobutadiene	AVRG	0.21210074	11.494	30.000
Caprolactam	AVRG	0.16108307	6.234	50.000
4-Chloro-3-methylphenol	AVRG	0.34308590	15.332	30.000
2-Methylnaphthalene	AVRG	0.66917294	16.097	50.000
Hexachlorocyclopentadiene	AVRG	0.39707275	8.476	50.000
2,4,6-Trichlorophenol	AVRG	0.46099466	14.822	30.000
2,4,5-Trichlorophenol	AVRG	0.54672600	15.253	50.000
1,1'-Biphenyl	AVRG	1.41212336	6.435	50.000
2-Chloronaphthalene	AVRG	1.06227993	14.872	50.000
2-Nitroaniline	AVRG	0.54374147	14.279	50.000
Dimethylphthalate	AVRG	1.55784112	15.768	50.000
2,6-Dinitrotoluene	AVRG	0.35192001	11.110	50.000
Acenaphthylene	AVRG	1.98732162	22.266	50.000
3-Nitroaniline	AVRG	0.37739775	9.590	50.000
Acenaphthene	AVRG	1.14340489	24.399	30.000
2,4-Dinitrophenol	AVRG	0.21014182	13.366	50.000
4-Nitrophenol	AVRG	0.29561108	13.352	50.000
2,4-Dinitrotoluene	AVRG	0.49249320	10.422	50.000
Dibenzofuran	AVRG	1.70152915	20.994	50.000
Diethylphthalate	AVRG	1.46943798	11.427	50.000
4-Chlorophenyl-phenylether	AVRG	0.62257129	13.017	50.000
Fluorene	AVRG	1.22227487	18.557	50.000
4-Nitroaniline	AVRG	0.40558873	9.844	50.000
4,6-Dinitro-2-methylphenol	AVRG	0.18108206	17.302	50.000
N-Nitrosodiphenylamine	AVRG	0.43337702	24.984	30.000
4-Bromophenyl-phenylether	AVRG	0.22905383	15.788	50.000

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: 5972HP64 Calibration Date(s): 11/07/02 11/07/02

Column: ID: 0.00 (mm) Calibration Time(s): 1136 1432

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Hexachlorobenzene	AVRG	0.25802471	11.592	50.000
Atrazine	AVRG	0.14249846	57.888	50.000
Pentachlorophenol	AVRG	0.17358015	15.876	30.000
Phenanthrene	AVRG	1.14457079	16.162	50.000
Anthracene	AVRG	1.17007834	15.758	50.000
Carbazole	AVRG	1.02103502	15.471	50.000
Di-n-butylphthalate	AVRG	1.60006539	13.559	50.000
Fluoranthene	AVRG	1.23918214	12.665	30.000
Pyrene	AVRG	1.48312678	12.989	50.000
Butylbenzylphthalate	AVRG	0.81574757	12.835	50.000
3,3'-Dichlorobenzidine	AVRG	0.40469248	16.429	50.000
bis(2-ethylhexyl)Phthalate	AVRG	1.11348579	14.270	50.000
Benzo(a)anthracene	AVRG	1.30138787	10.948	50.000
Chrysene	AVRG	1.13203135	16.507	50.000
Di-n-octylphthalate	AVRG	2.49352026	14.269	30.000
Benzo(b)fluoranthene	AVRG	1.78990242	6.511	50.000
Benzo(k)fluoranthene	AVRG	1.65203991	23.605	50.000
Benzo(a)pyrene	AVRG	1.46565601	12.241	30.000
Indeno(1,2,3-cd)pyrene	AVRG	1.37879157	11.869	50.000
Dibenzo(a,h)anthracene	AVRG	1.26812413	16.930	50.000
Benzo(g,h,i)perylene	AVRG	1.32820866	13.834	50.000
2-Fluorophenol	AVRG	1.85599370	3.533	50.000
Phenol-d5	AVRG	2.07305220	12.044	50.000
Nitrobenzene-d5	AVRG	0.54999573	9.750	50.000
2-Fluorobiphenyl	AVRG	1.40167410	20.101	50.000
2,4,6-Tribromophenol	AVRG	0.30417964	7.601	50.000
Terphenyl-d14	AVRG	0.95927827	11.890	50.000

Average %RSD test result.

Calculate Average %RSD: 14.35896301
Maximum Average %RSD: 15.00000000

Note: Passes Average %RSD Test.

FORM VI SV

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: 5972HP64 Calibration Date(s): 11/25/02 11/25/02

Column: RTX-5MS ID: 0.32 (mm) Calibration Time(s): 2041 2337

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Benzaldehyde	AVRG	1.13360798	18.776	50.000
Phenol	AVRG	1.61419381	10.437	30.000
Bis(2-chloroethyl)ether	AVRG	1.42279476	5.394	50.000
2-Chlorophenol	AVRG	1.32017786	5.673	50.000
2-Methylphenol	AVRG	1.35086999	10.127	50.000
2,2'-oxybis(1-Chloropropane)	AVRG	1.80136619	12.147	50.000
Acetophenone	AVRG	2.11766249	6.745	50.000
4-Methylphenol	AVRG	1.25831343	7.448	50.000
N-Nitroso-di-N-propylamine	AVRG	0.98072155	14.875	50.000
Hexachloroethane	AVRG	0.69301907	8.122	50.000
Nitrobenzene	AVRG	0.46992312	7.948	50.000
Isophorone	AVRG	0.80071477	4.460	50.000
2-Nitrophenol	AVRG	0.23220109	11.639	30.000
2,4-Dimethylphenol	AVRG	0.30596015	17.405	50.000
Bis(2-chloroethoxy)methane	AVRG	0.48218882	3.944	50.000
2,4-Dichlorophenol	AVRG	0.33477862	7.280	30.000
Naphthalene	AVRG	1.07954606	6.261	50.000
4-Chloroaniline	AVRG	0.49471199	5.176	50.000
Hexachlorobutadiene	AVRG	0.28158775	10.441	30.000
Caprolactam	AVRG	0.13579129	5.560	50.000
4-Chloro-3-methylphenol	AVRG	0.35560183	7.474	30.000
2-Methylnaphthalene	AVRG	0.79120021	11.071	50.000
Hexachlorocyclopentadiene	AVRG	0.44372014	17.611	50.000
2,4,6-Trichlorophenol	AVRG	0.44394950	10.060	30.000
2,4,5-Trichlorophenol	AVRG	0.50353440	12.902	50.000
1,1'-Biphenyl	AVRG	1.35796936	13.136	50.000
2-Chloronaphthalene	AVRG	0.99563885	11.264	50.000
2-Nitroaniline	AVRG	0.47461553	11.023	50.000
Dimethylphthalate	AVRG	1.40972693	14.700	50.000
2,6-Dinitrotoluene	AVRG	0.33539014	8.229	50.000
Acenaphthylene	AVRG	1.73675078	12.676	50.000
3-Nitroaniline	AVRG	0.34294245	8.665	50.000
Acenaphthene	AVRG	1.03570200	13.301	30.000
2,4-Dinitrophenol	AVRG	0.21159915	12.847	50.000
4-Nitrophenol	AVRG	0.31841348	14.689	50.000
2,4-Dinitrotoluene	AVRG	0.45746846	9.658	50.000
Dibenzofuran	AVRG	1.72116431	14.031	50.000
Diethylphthalate	AVRG	1.43888496	8.264	50.000
4-Chlorophenyl-phenylether	AVRG	0.68523536	18.722	50.000
Fluorene	AVRG	1.28222397	12.940	50.000
4-Nitroaniline	AVRG	0.35790926	13.788	50.000
4,6-Dinitro-2-methylphenol	AVRG	0.18420774	12.173	50.000
N-Nitrosodiphenylamine	AVRG	0.53755439	15.842	30.000
4-Bromophenyl-phenylether	AVRG	0.28145110	6.424	50.000

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: 5972HP64 Calibration Date(s): 11/25/02 11/25/02

Column: RTX-5MS ID: 0.32 (mm) Calibration Time(s): 2041 2337

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Hexachlorobenzene	AVRG	0.33354824	5.544	50.000
Atrazine	AVRG	0.13583776	69.746	50.000
Pentachlorophenol	AVRG	0.19474831	8.878	30.000
Phenanthrene	AVRG	1.17623288	7.801	50.000
Anthracene	AVRG	1.16871125	7.327	50.000
Carbazole	AVRG	1.04779295	9.078	50.000
Di-n-butylphthalate	AVRG	1.47285411	7.421	50.000
Fluoranthene	AVRG	1.34664335	6.073	30.000
Pyrene	AVRG	1.38506027	5.285	50.000
Butylbenzylphthalate	AVRG	0.68635712	5.722	50.000
3,3'-Dichlorobenzidine	AVRG	0.44742820	6.631	50.000
bis(2-ethylhexyl) Phthalate	AVRG	0.88166660	4.730	50.000
Benzo(a)anthracene	AVRG	1.29223432	4.680	50.000
Chrysene	AVRG	1.12418713	6.775	50.000
Di-n-octylphthalate	AVRG	2.12802595	3.080	30.000
Benzo(b)fluoranthene	AVRG	1.79263450	12.079	50.000
Benzo(k)fluoranthene	AVRG	1.73055574	14.984	50.000
Benzo(a)pyrene	AVRG	1.53613181	5.206	30.000
Indeno(1,2,3-cd)pyrene	AVRG	1.48389065	5.533	50.000
Dibenzo(a,h)anthracene	AVRG	1.40714919	4.582	50.000
Benzo(g,h,i)perylene	AVRG	1.42625822	6.157	50.000
2-Fluorophenol	AVRG	1.58282738	3.090	50.000
Phenol-d5	AVRG	1.81419241	7.581	50.000
Nitrobenzene-d5	AVRG	0.54448082	4.139	50.000
2-Fluorobiphenyl	AVRG	1.37030959	10.437	50.000
2,4,6-Tribromophenol	AVRG	0.37860091	8.911	50.000
Terphenyl-d14	AVRG	1.04946645	3.715	50.000

Average %RSD test result.

Calculate Average %RSD: 9.967387199
Maximum Average %RSD: 15.00000000

Note: Passes Average %RSD Test.

FORM VI SV

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: 5972HP64 Calibration Date: 11/22/02 Time: 1019

Lab File ID: HG021122A64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Benzaldehyde	1.3030000	1.1651793	0.01	-10.58	50.00	AVRG
Phenol	1.8980000	1.6293271	0.01	-14.16	20.00	AVRG
Bis(2-chloroethyl)ether	1.7080000	1.4830523	0.01	-13.17	50.00	AVRG
2-Chlorophenol	1.4280000	1.2796261	0.01	-10.39	50.00	AVRG
2-Methylphenol	1.3840000	1.2978379	0.01	-6.22	50.00	AVRG
2,2'-oxybis(1-Chloropropane)	2.2700000	1.8483868	0.01	-18.57	50.00	AVRG
Acetophenone	2.2450000	2.0209822	0.01	-9.98	50.00	AVRG
4-Methylphenol	1.3170000	1.1897913	0.01	-9.66	50.00	AVRG
N-Nitroso-di-N-propylamine	1.0240000	0.9014995	0.05	-11.96	50.00	AVRG
Hexachloroethane	0.6580000	0.6052762	0.01	-8.01	50.00	AVRG
Nitrobenzene	0.4940000	0.4200985	0.01	-14.96	50.00	AVRG
Isophorone	0.8630000	0.7945757	0.01	-7.93	50.00	AVRG
2-Nitrophenol	0.2290000	0.2108121	0.01	-7.94	20.00	AVRG
2,4-Dimethylphenol	0.2900000	0.2533387	0.01	-12.64	50.00	AVRG
Bis(2-chloroethoxy)methane	0.5180000	0.5196087	0.01	0.31	50.00	AVRG
2,4-Dichlorophenol	0.3040000	0.2927753	0.01	-3.69	20.00	AVRG
Naphthalene	1.0080000	0.9373401	0.01	-7.01	50.00	AVRG
4-Chloroaniline	0.4920000	0.5022370	0.01	2.08	50.00	AVRG
Hexachlorobutadiene	0.2120000	0.2385287	0.01	12.51	20.00	AVRG
Caprolactam	0.1610000	0.1428680	0.01	-11.26	50.00	AVRG
4-Chloro-3-methylphenol	0.3430000	0.3036214	0.01	-11.48	20.00	AVRG
2-Methylnaphthalene	0.6690000	0.6698702	0.01	0.13	50.00	AVRG
Hexachlorocyclopentadiene ✓	0.3970000	0.5383160	0.05	35.60	50.00	AVRG
2,4,6-Trichlorophenol	0.4610000	0.4560968	0.01	-1.06	20.00	AVRG
2,4,5-Trichlorophenol	0.5470000	0.5366028	0.01	-1.90	50.00	AVRG
1,1'-Biphenyl	1.4120000	1.2629345	0.01	-10.56	50.00	AVRG
2-Chloronaphthalene	1.0620000	1.0873407	0.01	2.39	50.00	AVRG
2-Nitroaniline	0.5440000	0.4513457	0.01	-17.03	50.00	AVRG
Dimethylphthalate	1.5580000	1.5882111	0.01	1.94	50.00	AVRG
2,6-Dinitrotoluene	0.3520000	0.3343790	0.01	-5.00	50.00	AVRG
Acenaphthylene	1.9870000	1.9614523	0.01	-1.28	50.00	AVRG
3-Nitroaniline	0.3770000	0.4424678	0.01	17.36	50.00	AVRG
Acenaphthene	1.1430000	1.1866482	0.01	3.82	20.00	AVRG
2,4-Dinitrophenol ✓	0.2100000	0.2638169	0.05	25.63	50.00	AVRG
4-Nitrophenol	0.2960000	0.3070832	0.05	3.74	50.00	AVRG
2,4-Dinitrotoluene	0.4930000	0.4776606	0.01	-3.11	50.00	AVRG
Dibenzofuran	1.7020000	1.6887696	0.01	-0.78	50.00	AVRG
Diethylphthalate	1.4700000	1.5803440	0.01	7.51	50.00	AVRG
4-Chlorophenyl-phenylether ✓	0.6220000	0.7626331	0.01	22.61	50.00	AVRG
Fluorene	1.2220000	1.2268635	0.01	0.40	50.00	AVRG
4-Nitroaniline	0.4060000	0.3868582	0.01	-4.71	50.00	AVRG
4,6-Dinitro-2-methylphenol ✓	0.1810000	0.2216393	0.01	22.45	50.00	AVRG

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: 5972HP64 Calibration Date: 11/22/02 Time: 1019

Lab File ID: HG021122A64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
N-Nitrosodiphenylamine	0.4340000	0.4100029	0.01	-5.53	20.00	AVRG
4-Bromophenyl-phenylether	0.2290000	0.2736866	0.01	19.51	50.00	AVRG
Hexachlorobenzene	0.2580000	0.3013021	0.01	16.78	50.00	AVRG
Atrazine	0.1420000	0.0911548	0.01	-35.81	50.00	AVRG
Pentachlorophenol	0.1740000	0.1922813	0.05	10.51	20.00	AVRG
Phenanthrene	1.1440000	1.1671277	0.01	2.02	50.00	AVRG
Anthracene	1.1700000	1.1259649	0.01	-3.76	50.00	AVRG
Carbazole	1.0210000	0.9331461	0.01	-8.60	50.00	AVRG
Di-n-butylphthalate	1.6000000	1.4727600	0.01	-7.95	50.00	AVRG
Fluoranthene	1.2390000	1.3153054	0.01	6.16	20.00	AVRG
Pyrene	1.4830000	1.4293918	0.01	-3.61	50.00	AVRG
Butylbenzylphthalate	0.8160000	0.7352465	0.01	-9.90	50.00	AVRG
3,3'-Dichlorobenzidine	0.4040000	0.3893713	0.01	-3.62	50.00	AVRG
bis(2-ethylhexyl)Phthalate	1.1140000	0.9595809	0.01	-13.86	50.00	AVRG
Benzo(a)anthracene	1.3010000	1.3439369	0.01	3.30	50.00	AVRG
Chrysene	1.1320000	1.1437222	0.01	1.04	50.00	AVRG
Di-n-octylphthalate	2.4940000	2.2503008	0.01	-9.77	20.00	AVRG
Benzo(b)fluoranthene	1.7900000	1.6948337	0.01	-5.32	50.00	AVRG
Benzo(k)fluoranthene	1.6520000	1.7344135	0.01	4.99	50.00	AVRG
Benzo(a)pyrene	1.4650000	1.5486914	0.01	5.71	20.00	AVRG
Indeno(1,2,3-cd)pyrene	1.3790000	1.3566458	0.01	-1.62	50.00	AVRG
Dibenzo(a,h)anthracene	1.2680000	1.2324717	0.01	-2.80	50.00	AVRG
Benzo(g,h,i)perylene	1.3280000	1.2220997	0.01	-7.97	50.00	AVRG
2-Fluorophenol	1.8560000	1.6134351	0.01	-13.07	50.00	AVRG
Phenol-d5	2.0730000	1.8107302	0.01	-12.65	50.00	AVRG
Nitrobenzene-d5	0.5500000	0.5200857	0.01	-5.44	50.00	AVRG
2-Fluorobiphenyl	1.4020000	1.5838940	0.01	12.97	50.00	AVRG
2,4,6-Tribromophenol	0.3040000	0.4043457	0.01	33.01	50.00	AVRG
Terphenyl-d14	0.9590000	1.0816144	0.01	12.78	50.00	AVRG

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: 5972HP64 Calibration Date: 11/25/02 Time: 2041

Lab File ID: HH021125B64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Benzaldehyde	1.1340000	0.9898664	0.01	-12.71	50.00	AVRG
Phenol	1.6140000	1.6892887	0.01	4.66	20.00	AVRG
Bis(2-chloroethyl)ether	1.4220000	1.3908189	0.01	-2.19	50.00	AVRG
2-Chlorophenol	1.3200000	1.2628807	0.01	-4.33	50.00	AVRG
2-Methylphenol	1.3510000	1.2850857	0.01	-4.88	50.00	AVRG
2,2'-oxybis(1-Chloropropane)	1.8010000	1.6814875	0.01	-6.64	50.00	AVRG
Acetophenone	2.1180000	2.0278005	0.01	-4.26	50.00	AVRG
4-Methylphenol	1.2580000	1.1120876	0.01	-11.60	50.00	AVRG
N-Nitroso-di-N-propylamine	0.9810000	0.9151027	0.05	-6.72	50.00	AVRG
Hexachloroethane	0.6930000	0.6403969	0.01	-7.59	50.00	AVRG
Nitrobenzene	0.4700000	0.4953005	0.01	5.38	50.00	AVRG
Isophorone	0.8010000	0.8262906	0.01	3.16	50.00	AVRG
2-Nitrophenol	0.2320000	0.2614023	0.01	12.67	20.00	AVRG
2,4-Dimethylphenol	0.3060000	0.3339641	0.01	9.14	50.00	AVRG
Bis(2-chloroethoxy)methane	0.4820000	0.4612289	0.01	-4.31	50.00	AVRG
2,4-Dichlorophenol	0.3350000	0.3517248	0.01	4.99	20.00	AVRG
Naphthalene	1.0790000	1.0814975	0.01	0.23	50.00	AVRG
4-Chloroaniline	0.4940000	0.4665232	0.01	-5.56	50.00	AVRG
Hexachlorobutadiene	0.2810000	0.3119597	0.01	11.02	20.00	AVRG
Caprolactam	0.1360000	0.1410000	0.01	3.68	50.00	AVRG
4-Chloro-3-methylphenol	0.3560000	0.3657979	0.01	2.75	20.00	AVRG
2-Methylnaphthalene	0.7910000	0.8127714	0.01	2.75	50.00	AVRG
Hexachlorocyclopentadiene	0.4440000	0.4221936	0.05	-4.91	50.00	AVRG
2,4,6-Trichlorophenol	0.4440000	0.4276015	0.01	-3.69	20.00	AVRG
2,4,5-Trichlorophenol	0.5040000	0.4952187	0.01	-1.74	50.00	AVRG
1,1'-Biphenyl	1.3580000	1.4049307	0.01	3.46	50.00	AVRG
2-Chloronaphthalene	0.9960000	0.9166661	0.01	-7.96	50.00	AVRG
2-Nitroaniline	0.4740000	0.4757048	0.01	0.36	50.00	AVRG
Dimethylphthalate	1.4100000	1.4185197	0.01	0.60	50.00	AVRG
2,6-Dinitrotoluene	0.3350000	0.3191908	0.01	-4.72	50.00	AVRG
Acenaphthylene	1.7360000	1.6708531	0.01	-3.75	50.00	AVRG
3-Nitroaniline	0.3430000	0.3009490	0.01	-12.26	50.00	AVRG
Acenaphthene	1.0360000	0.9333809	0.01	-9.90	20.00	AVRG
2,4-Dinitrophenol	0.2120000	0.1834203	0.05	-13.48	50.00	AVRG
4-Nitrophenol	0.3180000	0.2652360	0.05	-16.59	50.00	AVRG
2,4-Dinitrotoluene	0.4570000	0.4057725	0.01	-11.21	50.00	AVRG
Dibenzofuran	1.7210000	1.6659361	0.01	-3.20	50.00	AVRG
Diethylphthalate	1.4390000	1.2440337	0.01	-13.55	50.00	AVRG
4-Chlorophenyl-phenylether	0.6850000	0.5372212	0.01	-21.57	50.00	AVRG
Fluorene	1.2820000	1.1947876	0.01	-6.80	50.00	AVRG
4-Nitroaniline	0.3580000	0.3383000	0.01	-5.50	50.00	AVRG
4,6-Dinitro-2-methylphenol	0.1840000	0.1913707	0.01	4.00	50.00	AVRG

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: 5972HP64 Calibration Date: 11/25/02 Time: 2041

Lab File ID: HH021125B64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
N-Nitrosodiphenylamine	0.5380000	0.5838686	0.01	8.52	20.00	AVRG	
4-Bromophenyl-phenylether	0.2810000	0.2642355	0.01	-5.97	50.00	AVRG	
Hexachlorobenzene	0.3340000	0.3184055	0.01	-4.67	50.00	AVRG	
Atrazine	0.1360000	0.0651441	0.01	-52.10	50.00	AVRG	<-
Pentachlorophenol	0.1940000	0.1911652	0.05	-1.46	20.00	AVRG	
Phenanthrene	1.1760000	1.1386109	0.01	-3.18	50.00	AVRG	
Anthracene	1.1690000	1.1147846	0.01	-4.64	50.00	AVRG	
Carbazole	1.0480000	1.0512204	0.01	0.31	50.00	AVRG	
Di-n-butylphthalate	1.4730000	1.4646508	0.01	-0.57	50.00	AVRG	
Fluoranthene	1.3470000	1.3450503	0.01	-0.14	20.00	AVRG	
Pyrene	1.3850000	1.3488802	0.01	-2.61	50.00	AVRG	
Butylbenzylphthalate	0.6860000	0.6757236	0.01	-1.50	50.00	AVRG	
3,3'-Dichlorobenzidine	0.4470000	0.4501383	0.01	0.70	50.00	AVRG	
bis(2-ethylhexyl)Phthalate	0.8820000	0.8502830	0.01	-3.60	50.00	AVRG	
Benzo(a)anthracene	1.2920000	1.2625843	0.01	-2.28	50.00	AVRG	
Chrysene	1.1240000	1.1186654	0.01	-0.47	50.00	AVRG	
Di-n-octylphthalate	2.1280000	2.0787064	0.01	-2.32	20.00	AVRG	
Benzo(b)fluoranthene	1.7930000	2.0383239	0.01	13.68	50.00	AVRG	
Benzo(k)fluoranthene	1.7300000	1.5248047	0.01	-11.86	50.00	AVRG	
Benzo(a)pyrene	1.5360000	1.5362536	0.01	0.02	20.00	AVRG	
Indeno(1,2,3-cd)pyrene	1.4840000	1.5854984	0.01	6.84	50.00	AVRG	
Dibenzo(a,h)anthracene	1.4070000	1.4675269	0.01	4.30	50.00	AVRG	
Benzo(g,h,i)perylene	1.4260000	1.4485221	0.01	1.58	50.00	AVRG	
2-Fluorophenol	1.5830000	1.5535910	0.01	-1.86	50.00	AVRG	
Phenol-d5	1.8140000	1.7174188	0.01	-5.32	50.00	AVRG	
Nitrobenzene-d5	0.5440000	0.5631063	0.01	3.51	50.00	AVRG	
2-Fluorobiphenyl	1.3700000	1.2548829	0.01	-8.40	50.00	AVRG	
2,4,6-Tribromophenol	0.3780000	0.3632347	0.01	-3.91	50.00	AVRG	
Terphenyl-d14	1.0500000	1.0490905	0.01	-0.09	50.00	AVRG	

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: 5972HP64 Calibration Date: 12/03/02 Time: 0818

Lab File ID: HG021203A64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Benzaldehyde	1.1340000	1.1063824	0.01	-2.44	50.00	AVRG
Phenol	1.6140000	1.7230624	0.01	6.76	20.00	AVRG
Bis(2-chloroethyl)ether	1.4220000	1.4765532	0.01	3.84	50.00	AVRG
2-Chlorophenol	1.3200000	1.1947832	0.01	-9.49	50.00	AVRG
2-Methylphenol	1.3510000	1.2216191	0.01	-9.58	50.00	AVRG
2,2'-oxybis(1-Chloropropane)	1.8010000	2.2658332	0.01	25.81	50.00	AVRG
Acetophenone	2.1180000	1.9326894	0.01	-8.75	50.00	AVRG
4-Methylphenol	1.2580000	1.0839223	0.01	-13.84	50.00	AVRG
N-Nitroso-di-N-propylamine	0.9810000	0.9131617	0.05	-6.92	50.00	AVRG
Hexachloroethane	0.6930000	0.5734488	0.01	-17.25	50.00	AVRG
Nitrobenzene	0.4700000	0.5167737	0.01	9.95	50.00	AVRG
Isophorone	0.8010000	0.9357324	0.01	16.82	50.00	AVRG
2-Nitrophenol	0.2320000	0.2485925	0.01	7.15	20.00	AVRG
2,4-Dimethylphenol	0.3060000	0.3253109	0.01	6.31	50.00	AVRG
Bis(2-chloroethoxy)methane	0.4820000	0.5116661	0.01	6.15	50.00	AVRG
2,4-Dichlorophenol	0.3350000	0.3351405	0.01	0.04	20.00	AVRG
Naphthalene	1.0790000	1.0847187	0.01	0.53	50.00	AVRG
4-Chloroaniline	0.4940000	0.4652517	0.01	-5.82	50.00	AVRG
Hexachlorobutadiene	0.2810000	0.2547416	0.01	-9.34	20.00	AVRG
Caprolactam	0.1360000	0.1389416	0.01	2.16	50.00	AVRG
4-Chloro-3-methylphenol	0.3560000	0.3514961	0.01	-1.26	20.00	AVRG
2-Methylnaphthalene	0.7910000	0.7556158	0.01	-4.47	50.00	AVRG
Hexachlorocyclopentadiene	0.4440000	0.3455048	0.05	-22.18	50.00	AVRG
2,4,6-Trichlorophenol	0.4440000	0.3608926	0.01	-18.72	20.00	AVRG
2,4,5-Trichlorophenol	0.5040000	0.4744275	0.01	-5.87	50.00	AVRG
1,1'-Biphenyl	1.3580000	1.3194922	0.01	-2.84	50.00	AVRG
2-Chloronaphthalene	0.9960000	0.8633902	0.01	-13.31	50.00	AVRG
2-Nitroaniline	0.4740000	0.5296744	0.01	11.74	50.00	AVRG
Dimethylphthalate	1.4100000	1.3418837	0.01	-4.83	50.00	AVRG
2,6-Dinitrotoluene	0.3350000	0.3152588	0.01	-5.89	50.00	AVRG
Acenaphthylene	1.7360000	1.6648522	0.01	-4.10	50.00	AVRG
3-Nitroaniline	0.3430000	0.3000793	0.01	-12.51	50.00	AVRG
Acenaphthene	1.0360000	0.9185924	0.01	-11.33	20.00	AVRG
2,4-Dinitrophenol	0.2120000	0.1632774	0.05	-22.98	50.00	AVRG
4-Nitrophenol	0.3180000	0.2291896	0.05	-27.93	50.00	AVRG
2,4-Dinitrotoluene	0.4570000	0.4093626	0.01	-10.42	50.00	AVRG
Dibenzofuran	1.7210000	1.6949623	0.01	-1.51	50.00	AVRG
Diethylphthalate	1.4390000	1.2402150	0.01	-13.81	50.00	AVRG
4-Chlorophenyl-phenylether	0.6850000	0.5283143	0.01	-22.87	50.00	AVRG
Fluorene	1.2820000	1.1985725	0.01	-6.51	50.00	AVRG
4-Nitroaniline	0.3580000	0.3334613	0.01	-6.85	50.00	AVRG
4,6-Dinitro-2-methylphenol	0.1840000	0.1920705	0.01	4.39	50.00	AVRG

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Instrument ID: 5972HP64 Calibration Date: 12/03/02 Time: 0818

Lab File ID: HG021203A64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
N-Nitrosodiphenylamine	0.5380000	0.5833781	0.01	8.43	20.00	AVRG
4-Bromophenyl-phenylether	0.2810000	0.2533624	0.01	-9.84	50.00	AVRG
Hexachlorobenzene	0.3340000	0.3004832	0.01	-10.03	50.00	AVRG
Atrazine	0.1360000	0.0750325	0.01	-44.83	50.00	AVRG
Pentachlorophenol	0.1940000	0.1712977	0.05	-11.70	20.00	AVRG
Phenanthrene	1.1760000	1.1967142	0.01	1.76	50.00	AVRG
Anthracene	1.1690000	1.0868345	0.01	-7.03	50.00	AVRG
Carbazole	1.0480000	1.1115563	0.01	6.06	50.00	AVRG
Di-n-butylphthalate	1.4730000	1.4967253	0.01	1.61	50.00	AVRG
Fluoranthene	1.3470000	1.2911122	0.01	-4.15	20.00	AVRG
Pyrene	1.3850000	1.5291007	0.01	10.40	50.00	AVRG
Butylbenzylphthalate	0.6860000	0.8147271	0.01	18.76	50.00	AVRG
3,3'-Dichlorobenzidine	0.4470000	0.4098217	0.01	-8.32	50.00	AVRG
bis(2-ethylhexyl)Phthalate	0.8820000	0.9545497	0.01	8.22	50.00	AVRG
Benzo(a)anthracene	1.2920000	1.3357046	0.01	3.38	50.00	AVRG
Chrysene	1.1240000	1.0780790	0.01	-4.08	50.00	AVRG
Di-n-octylphthalate	2.1280000	2.4404141	0.01	14.68	20.00	AVRG
Benzo(b)fluoranthene	1.7930000	1.4856376	0.01	-17.14	50.00	AVRG
Benzo(k)fluoranthene	1.7300000	1.8600465	0.01	7.52	50.00	AVRG
Benzo(a)pyrene	1.5360000	1.4050606	0.01	-8.52	20.00	AVRG
Indeno(1,2,3-cd)pyrene	1.4840000	1.2195281	0.01	-17.82	50.00	AVRG
Dibenzo(a,h)anthracene	1.4070000	0.9287468	0.01	-33.99	50.00	AVRG
Benzo(g,h,i)perylene	1.4260000	0.9305294	0.01	-34.74	50.00	AVRG
2-Fluorophenol	1.5830000	1.5080454	0.01	-4.73	50.00	AVRG
Phenol-d5	1.8140000	1.7610008	0.01	-2.92	50.00	AVRG
Nitrobenzene-d5	0.5440000	0.5862255	0.01	7.76	50.00	AVRG
2-Fluorobiphenyl	1.3700000	1.2845620	0.01	-6.24	50.00	AVRG
2,4,6-Tribromophenol	0.3780000	0.3180302	0.01	-15.86	50.00	AVRG
Terphenyl-d14	1.0500000	1.1233450	0.01	6.98	50.00	AVRG

3C
WATER SEMIVOLATILE LAB CONTROL SAMPLE

SVPLCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Benzaldehyde	80.00	25.52	32	10-100
Phenol	80.00	41.62	52	15-100
Bis(2-chloroethyl)ether	80.00	49.48	62	35-100
2-Chlorophenol	80.00	74.11	93	39-102
2-Methylphenol	80.00	56.23	70	36-100
2,2'-oxybis(1-Chloropro	80.00	51.95	65	32-100
Acetophenone	80.00	55.83	70	28-100
4-Methylphenol	160.0	97.38	61	10-150
N-Nitroso-di-N-prop.(1)	80.00	57.93	72	23-121
Hexachloroethane	80.00	43.75	55	27-101
Nitrobenzene	80.00	49.64	62	35-103
Isophorone	80.00	47.93	60	37-101
2-Nitrophenol	80.00	76.45	96	39-104
2,4-Dimethylphenol	80.00	95.08	119	13-120
Bis(2-chloroethoxy)meth	80.00	51.86	65	49-113
2,4-Dichlorophenol	80.00	95.74	120*	41-112
Naphthalene	80.00	59.13	74	30-100
4-Chloroaniline	80.00	59.97	75	33-102
Hexachlorobutadiene	80.00	46.56	58	29-107
Caprolactam	80.00	19.33	24	10-100
4-Chloro-3-methylphenol	80.00	105.3	132*	45-110
2-Methylnaphthalene	80.00	68.21	85	30-130
Hexachlorocyclopentadie	80.00	43.59	54	10-128
2,4,6-Trichlorophenol	80.00	83.40	104	41-126
2,4,5-Trichlorophenol	80.00	61.86	77	43-122
1,1'-Biphenyl	80.00	57.25	72	41-100
2-Chloronaphthalene	80.00	54.15	68	29-119
2-Nitroaniline	80.00	73.29	92	48-109

(1) N-Nitroso-di-n-propylamine
Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

3C

WATER SEMIVOLATILE LAB CONTROL SAMPLE

SWLLCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Benzaldehyde	80.00	37.79	47	10-100
Phenol	80.00	56.04	70	15-100
Bis(2-chloroethyl)ether	80.00	60.84	76	35-100
2-Chlorophenol	80.00	97.90	122*	39-102
2-Methylphenol	80.00	65.26	82	36-100
2,2'-oxybis(1-Chloropro	80.00	54.81	68	32-100
Acetophenone	80.00	62.58	78	28-100
4-Methylphenol	160.0	110.1	69	10-150
N-Nitroso-di-N-prop.(1)	80.00	67.92	85	23-121
Hexachloroethane	80.00	59.84	75	27-101
Nitrobenzene	80.00	65.63	82	35-103
Isophorone	80.00	65.62	82	37-101
2-Nitrophenol	80.00	109.8	137*	39-104
2,4-Dimethylphenol	80.00	129.3	162*	13-120
Bis(2-chloroethoxy)meth	80.00	64.17	80	49-113
2,4-Dichlorophenol	80.00	124.8	156*	41-112
Naphthalene	80.00	77.47	97	30-100
4-Chloroaniline	80.00	71.75	90	33-102
Hexachlorobutadiene	80.00	91.43	114*	29-107
Caprolactam	80.00	24.68	31	10-100
4-Chloro-3-methylphenol	80.00	131.5	164*	45-110
2-Methylnaphthalene	80.00	85.94	107	30-130
Hexachlorocyclopentadie	80.00	65.14	81	10-128
2,4,6-Trichlorophenol	80.00	104.2	130*	41-126
2,4,5-Trichlorophenol	80.00	80.24	100	43-122
1,1'-Biphenyl	80.00	76.74	96	41-100
2-Chloronaphthalene	80.00	65.69	82	29-119
2-Nitroaniline	80.00	72.15	90	48-109

(1) N-Nitroso-di-n-propylamine
Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

3C
WATER SEMIVOLATILE LAB CONTROL SAMPLE

SWLLCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Dimethylphthalate	80.00	65.26	82	44-100
2,6-Dinitrotoluene	80.00	73.07	91	46-117
Acenaphthylene	80.00	68.35	85	40-103
3-Nitroaniline	80.00	87.90	110*	39-104
Acenaphthene	80.00	65.41	82	33-100
2,4-Dinitrophenol	80.00	81.31	102	10-117
4-Nitrophenol	80.00	42.01	52	10-100
2,4-Dinitrotoluene	80.00	75.37	94	36-116
Dibenzofuran	80.00	74.34	93	51-103
Diethylphthalate	80.00	72.62	91	44-103
4-Chlorophenyl-phenylet	80.00	68.40	86	43-107
Fluorene	80.00	79.32	99	36-106
4-Nitroaniline	80.00	62.07	78	26-108
4,6-Dinitro-2-methylphe	80.00	96.33	120	10-130
N-Nitrosodiphenylamine	80.00	92.01	115*	44-108
4-Bromophenyl-phenyleth	80.00	90.79	113*	48-108
Hexachlorobenzene	80.00	86.83	108	42-123
Atrazine	80.00	117.8	147	70-150
Pentachlorophenol	80.00	141.9	177*	12-150
Phenanthrene	80.00	75.09	94	38-108
Anthracene	80.00	74.40	93	38-107
Carbazole	80.00	72.87	91	54-111
Di-n-butylphthalate	80.00	68.33	85	46-111
Fluoranthene	80.00	82.31	103	36-111
Pyrene	80.00	77.93	97	29-114
Butylbenzylphthalate	80.00	68.05	85	38-111
3,3'-Dichlorobenzidine	80.00	52.44	66	20-107
bis(2-ethylhexyl)Phthal	80.00	63.17	79	36-114

(1) N-Nitroso-di-n-propylamine
Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

3C
WATER SEMIVOLATILE LAB CONTROL SAMPLE

SWLLCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Benzo(a)anthracene	80.00	80.36	100	35-106
Chrysene	80.00	75.50	94	37-110
Di-n-octylphthalate	80.00	70.05	88	40-117
Benzo(b)fluoranthene	80.00	79.28	99	33-112
Benzo(k)fluoranthene	80.00	88.02	110*	37-109
Benzo(a)pyrene	80.00	88.03	110*	37-106
Indeno(1,2,3-cd)pyrene	80.00	78.03	98	39-104
Dibenzo(a,h)anthracene	80.00	77.60	97	31-109
Benzo(g,h,i)perylene	80.00	72.41	90	35-107

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

Spike Recovery: 13 out of 65 outside limits

COMMENTS: _____

3C
WATER SEMIVOLATILE LAB CONTROL SAMPLE

SXQLCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Dimethylphthalate	80.00	68.03	85	44-100
2,6-Dinitrotoluene	80.00	81.48	102	46-117
Acenaphthylene	80.00	90.90	114*	40-103
3-Nitroaniline	80.00	85.43	107*	39-104
Acenaphthene	80.00	96.04	120*	33-100
2,4-Dinitrophenol	80.00	76.64	96	10-117
4-Nitrophenol	80.00	35.03	44	10-100
2,4-Dinitrotoluene	80.00	70.43	88	36-116
Dibenzofuran	80.00	84.18	105*	51-103
Diethylphthalate	80.00	85.44	107*	44-103
4-Chlorophenyl-phenylet	80.00	80.22	100	43-107
Fluorene	80.00	75.49	94	36-106
4-Nitroaniline	80.00	92.95	116*	26-108
4,6-Dinitro-2-methylphe	80.00	69.58	87	10-130
N-Nitrosodiphenylamine	80.00	67.31	84	44-108
4-Bromophenyl-phenyleth	80.00	73.14	91	48-108
Hexachlorobenzene	80.00	68.24	85	42-123
Atrazine	80.00	128.3	160*	70-150
Pentachlorophenol	80.00	71.63	90	12-150
Phenanthrene	80.00	77.74	97	38-108
Anthracene	80.00	82.01	102	38-107
Carbazole	80.00	60.36	75	54-111
Di-n-butylphthalate	80.00	73.19	91	46-111
Fluoranthene	80.00	81.00	101	36-111
Pyrene	80.00	83.49	104	29-114
Butylbenzylphthalate	80.00	74.44	93	38-111
3,3'-Dichlorobenzidine	80.00	53.29	67	20-107
bis(2-ethylhexyl)Phthal	80.00	77.22	96	36-114

(1) N-Nitroso-di-n-propylamine
Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

DATA VALIDATION WORKSHEET
Pesticides/PCBs

Reviewer: RA
Date: 11/7/03
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: R2788
Test Name: PEST
Method No.: 8081A

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?			✓
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

	collected	extracted	analyzed
	11/13,02	11/12,02	11/17,02	11/19,02
	11/18,02,	11/15,02,	11/14,02	11/20,02	12/18,02
		11/20,02,	11/19,02	11/25,02	11/26,02

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.	V		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.			✓

Notes: MB pos for beta-BHC, heptachlor, ~~Aroclor-1016, Aroclor-1260~~

no pos. in samples, no action.

4.0 Initial and Continuing Calibration

		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		

Notes: see attached all pos. bias all ND, no flags

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	✓		
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	✓		
/	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.			
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?			
5.4	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			
5.5	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).			
5.6	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	✓		
5.7	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	✓		
5.8	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	✓		

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
6.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			✓
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
1 out	high/low	No action	No action
2 out	2 high same column	K	No action
	2 low same column	L, UL	No action
	mixed same column	J, UJ	No action
	2 high diff columns	J	Not applicable
	2 low diff columns	J, UJ	Not applicable
	mixed diff columns	Professional judgement	Not applicable
3 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	2 high, 1 low	K (2 high)	J (1 low 2nd column)
	2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
	other mixed	J, UJ	Not applicable
4 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	Mixed	J, UJ	Not applicable

If any recovery is >0% and <10% then L(+)/R(-).

If any recovery is 0% then R(+/-).

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?			
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: 4,4-DDT LCS 180% 38-127%.

all ND, no action

9.0 Field Duplicate

		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).			✓
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes: all ND

11.0 Pesticide Cleanup Checks (Required when any positive result is reported > 38 ug/Kg for soils)		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
12.1.4	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = _____			

Notes:

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKVY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21478-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: _____

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/18/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.043	J
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.40	U
72-55-9	4,4'-DDE	0.20	U
50-29-3	4,4'-DDT	0.60	U
60-57-1	Dieldrin	0.20	U
959-98-8	Endosulfan I	0.20	U
33213-65-9	Endosulfan II	0.40	U
1031-07-8	Endosulfan sulfate	0.40	U
72-20-8	Endrin	0.40	U
7421-93-4	Endrin Aldehyde	0.40	U
76-44-8	Heptachlor	0.041	J
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.20	U

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN34 Calibration Date: 11/19/02 Time: 0450

Lab File ID: 237YINDAMQF Init. Calib. Date(s): 11/04/02 11/05/02

Init. Calib. Times: 1930 0624

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1989890.0	1867425.0	0.01	-6.15	15.00	AVRG	
alpha-BHC	2076035.0	1960750.0	0.01	-5.55	15.00	AVRG	
beta-BHC	632273.75	609375.00	0.01	-3.62	15.00	AVRG	
delta-BHC	1964995.0	1923150.0	0.01	-2.13	15.00	AVRG	
gamma-BHC (Lindane)	1959167.5	1870300.0	0.01	-4.54	15.00	AVRG	
4,4'-DDD	1112333.7	1070281.2	0.01	-3.78	15.00	AVRG	
4,4'-DDE	1521398.8	1467362.5	0.01	-3.55	15.00	AVRG	
4,4'-DDT	836322.50	1178175.0	0.01	40.88	15.00	AVRG	<-
Dieldrin	1679632.5	1682662.5	0.01	0.18	15.00	AVRG	
Endosulfan I	1543796.3	1520375.0	0.01	-1.52	15.00	AVRG	
Endosulfan II	1320310.0	1320168.8	0.01	-0.01	15.00	AVRG	
Endosulfan sulfate	1200203.1	1118937.5	0.01	-6.77	15.00	AVRG	
Endrin	1519251.9	1436037.5	0.01	-5.48	15.00	AVRG	
Endrin Aldehyde	1082145.0	1000662.5	0.01	-7.53	15.00	AVRG	
Heptachlor	2065193.9	1993350.0	0.01	-3.48	15.00	AVRG	
Heptachlor Epoxide	1808845.0	1735775.0	0.01	-4.04	15.00	AVRG	
Methoxychlor	574932.75	571002.50	0.01	-0.68	15.00	AVRG	
Toxaphene	67822.250		0.01	-100.00	15.00	AVRG	<-
(2)	0.0000000		0.01	0.00	15.00	AVRG	<-
(3)	104327.00		0.01	-100.00	15.00	AVRG	<-
(4)	79750.750		0.01	-100.00	15.00	AVRG	<-
(5)	66276.000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	12793.200	11309.667	0.01	-11.60	15.00	AVRG	
(2)	16982.633	15869.667	0.01	-6.55	15.00	AVRG	
(3)	42220.600	40029.000	0.01	-5.19	15.00	AVRG	
(4)	19797.900	19542.333	0.01	-1.29	15.00	AVRG	
(5)	13191.267	14847.333	0.01	12.55	15.00	AVRG	
Aroclor-1221	2003.7500		0.01	-100.00	15.00	AVRG	<-
(2)	5701.5000		0.01	-100.00	15.00	AVRG	<-
(3)	3495.2500		0.01	-100.00	15.00	AVRG	<-
(4)	16120.750		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	13992.667		0.01	-100.00	15.00	AVRG	<-
(2)	7103.0000		0.01	-100.00	15.00	AVRG	<-
(3)	17757.667		0.01	-100.00	15.00	AVRG	<-
(4)	8357.6670		0.01	-100.00	15.00	AVRG	<-
(5)	4917.3330		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	11241.500		0.01	-100.00	15.00	AVRG	<-
(2)	14039.500		0.01	-100.00	15.00	AVRG	<-
(3)	34476.000		0.01	-100.00	15.00	AVRG	<-
(4)	18677.000		0.01	-100.00	15.00	AVRG	<-
(5)	15724.000		0.01	-100.00	15.00	AVRG	<-

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN35 Calibration Date: 11/19/02 Time: 0450

Lab File ID: 237YINDAMQF Init. Calib. Date(s): 11/04/02 11/05/02

Init. Calib. Times: 1930 0624

GC Column: CLPEST2 ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1429667.5	1393875.0	0.01	-2.50	15.00	AVRG	
alpha-BHC	1440822.5	1460200.0	0.01	1.34	15.00	AVRG	
beta-BHC	446897.50	461975.00	0.01	3.37	15.00	AVRG	
delta-BHC	1199565.0	1266575.0	0.01	5.59	15.00	AVRG	
gamma-BHC (Lindane)	1337300.0	1380650.0	0.01	3.24	15.00	AVRG	
4,4'-DDD	719874.37	723237.50	0.01	0.47	15.00	AVRG	
4,4'-DDE	1088137.5	1047050.0	0.01	-3.78	15.00	AVRG	
4,4'-DDT	480297.08	719916.67	0.01	49.89	15.00	AVRG	<-
Dieldrin	1184480.0	1218512.5	0.01	2.87	15.00	AVRG	
Endosulfan I	1090856.2	1122125.0	0.01	2.87	15.00	AVRG	
Endosulfan II	917724.38	927337.50	0.01	1.05	15.00	AVRG	
Endosulfan sulfate	580490.00	617362.50	0.01	6.35	15.00	AVRG	
Endrin	1056840.0	1005281.2	0.01	-4.88	15.00	AVRG	
Endrin Aldehyde	653961.25	689093.75	0.01	5.37	15.00	AVRG	
Heptachlor	1418778.9	1418675.0	0.01	-0.01	15.00	AVRG	
Heptachlor Epoxide	1321115.0	1287475.0	0.01	-2.55	15.00	AVRG	
Methoxychlor	331596.00	359917.50	0.01	8.54	15.00	AVRG	
Toxaphene	56916.250		0.01	-100.00	15.00	AVRG	<-
(2)	58163.250		0.01	-100.00	15.00	AVRG	<-
(3)	42762.000		0.01	-100.00	15.00	AVRG	<-
(4)	65953.500		0.01	-100.00	15.00	AVRG	<-
(5)	40463.250		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	7621.5000	7699.3333	0.01	1.02	15.00	AVRG	
(2)	10716.033	10377.000	0.01	-3.16	15.00	AVRG	
(3)	27582.600	27567.333	0.01	-0.06	15.00	AVRG	
(4)	13951.033	13975.333	0.01	0.17	15.00	AVRG	
(5)	7476.0670	7947.6667	0.01	6.31	15.00	AVRG	
Aroclor-1221	1047.7500		0.01	-100.00	15.00	AVRG	<-
(2)	3580.0000		0.01	-100.00	15.00	AVRG	<-
(3)	2580.7500		0.01	-100.00	15.00	AVRG	<-
(4)	10801.250		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	9575.0000		0.01	-100.00	15.00	AVRG	<-
(2)	4631.6670		0.01	-100.00	15.00	AVRG	<-
(3)	11605.667		0.01	-100.00	15.00	AVRG	<-
(4)	2913.0000		0.01	-100.00	15.00	AVRG	<-
(5)	5712.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	7746.0000		0.01	-100.00	15.00	AVRG	<-
(2)	8422.5000		0.01	-100.00	15.00	AVRG	<-
(3)	22455.000		0.01	-100.00	15.00	AVRG	<-
(4)	11549.500		0.01	-100.00	15.00	AVRG	<-
(5)	11545.500		0.01	-100.00	15.00	AVRG	<-

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: TRACEGC83 Calibration Date: 12/18/02 Time: 1757

Lab File ID: 102VINDAMYD Init. Calib. Date(s): 12/12/02 12/13/02

Init. Calib. Times: 1527** 0119

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	299632.50	316025.00	0.01	5.47	15.00	AVRG	
alpha-BHC	293255.00	327750.00	0.01	11.76	15.00	AVRG	
beta-BHC	136143.75	143737.50	0.01	5.58	15.00	AVRG	
delta-BHC	246970.00	283575.00	0.01	14.82	15.00	AVRG	
gamma-BHC (Lindane)	287952.50	313450.00	0.01	8.85	15.00	AVRG	
4,4'-DDD	149313.75	161943.75	0.01	8.46	15.00	AVRG	
4,4'-DDE	221872.50	236800.00	0.01	6.73	15.00	AVRG	
4,4'-DDT	110432.08	115779.17	0.01	4.84	15.00	AVRG	
Dieldrin	232912.50	246225.00	0.01	5.72	15.00	AVRG	
Endosulfan I	239640.00	257125.00	0.01	7.30	15.00	AVRG	
Endosulfan II	214662.50	226837.50	0.01	5.67	15.00	AVRG	
Endosulfan sulfate	190596.87	203600.00	0.01	6.82	15.00	AVRG	
Endrin	215197.50	235593.75	0.01	9.48	15.00	AVRG	
Endrin Aldehyde ✓	164720.62	190143.75	0.01	15.43	15.00	AVRG	<-
Heptachlor	320753.18	347675.00	0.01	8.39	15.00	AVRG	
Heptachlor Epoxide	287390.00	300200.00	0.01	4.46	15.00	AVRG	
Methoxychlor	94602.750	98150.000	0.01	3.75	15.00	AVRG	
Toxaphene	6692.7500		0.01	-100.00	15.00	AVRG	<-
(2)	21254.500		0.01	-100.00	15.00	AVRG	<-
(3)	19796.500		0.01	-100.00	15.00	AVRG	<-
(4)	14543.000		0.01	-100.00	15.00	AVRG	<-
(5)	17864.750		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	3938.0670	3867.3333	0.01	-1.80	15.00	AVRG	
(2)	6771.6330	6460.6667	0.01	-4.59	15.00	AVRG	
(3)	14130.367	13965.333	0.01	-1.17	15.00	AVRG	
(4)	6441.1330	6356.3333	0.01	-1.32	15.00	AVRG	
(5)	4320.4670	4192.0000	0.01	-2.97	15.00	AVRG	
Aroclor-1221	1265.5000		0.01	-100.00	15.00	AVRG	<-
(2)	1945.7500		0.01	-100.00	15.00	AVRG	<-
(3)	1400.0000		0.01	-100.00	15.00	AVRG	<-
(4)	4723.7500		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	4282.0000		0.01	-100.00	15.00	AVRG	<-
(2)	2984.0000		0.01	-100.00	15.00	AVRG	<-
(3)	5931.6670		0.01	-100.00	15.00	AVRG	<-
(4)	1671.0000		0.01	-100.00	15.00	AVRG	<-
(5)	1768.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	3391.5000		0.01	-100.00	15.00	AVRG	<-
(2)	5360.5000		0.01	-100.00	15.00	AVRG	<-
(3)	11165.500		0.01	-100.00	15.00	AVRG	<-
(4)	5137.5000		0.01	-100.00	15.00	AVRG	<-
(5)	4565.5000		0.01	-100.00	15.00	AVRG	<-

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: TRACEGC82 Calibration Date: 12/18/02 Time: 2345

Lab File ID: 114VINDAMYF Init. Calib. Date(s): 12/12/02 12/13/02

Init. Calib. Times: 1527 0119

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	193610.00	217475.00	0.01	12.33	15.00	AVRG	
alpha-BHC	181057.50	203925.00	0.01	12.63	15.00	AVRG	
beta-BHC	88170.000	92050.000	0.01	4.40	15.00	AVRG	
delta-BHC	147937.50	175750.00	0.01	18.80	15.00	AVRG	<-
gamma-BHC (Lindane)	179340.00	203900.00	0.01	13.69	15.00	AVRG	
4,4'-DDD	104684.38	124700.00	0.01	19.12	15.00	AVRG	<-
4,4'-DDE	172201.25	196300.00	0.01	13.99	15.00	AVRG	
4,4'-DDT	80575.417	95012.500	0.01	17.92	15.00	AVRG	<-
Dieldrin	167756.25	183975.00	0.01	9.67	15.00	AVRG	
Endosulfan I	174043.75	192287.50	0.01	10.48	15.00	AVRG	
Endosulfan II	153560.00	173250.00	0.01	12.82	15.00	AVRG	
Endosulfan sulfate	144008.75	164056.25	0.01	13.92	15.00	AVRG	
Endrin	149835.62	176468.75	0.01	17.77	15.00	AVRG	<-
Endrin Aldehyde	127893.75	151118.75	0.01	18.16	15.00	AVRG	<-
Heptachlor	218737.95	247225.00	0.01	13.02	15.00	AVRG	
Heptachlor Epoxide	190610.00	211375.00	0.01	10.89	15.00	AVRG	
Methoxychlor	72869.750	78882.500	0.01	8.25	15.00	AVRG	
Toxaphene	7715.5000		0.01	-100.00	15.00	AVRG	<-
(2)	11369.500		0.01	-100.00	15.00	AVRG	<-
(3)	12543.500		0.01	-100.00	15.00	AVRG	<-
(4)	11321.250		0.01	-100.00	15.00	AVRG	<-
(5)	11078.250		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	3022.8000	3007.6667	0.01	-0.50	15.00	AVRG	
(2)	4891.5330	4987.0000	0.01	1.95	15.00	AVRG	
(3)	10898.800	10676.000	0.01	-2.04	15.00	AVRG	
(4)	4987.8340	4935.0000	0.01	-1.06	15.00	AVRG	
(5)	4675.0670	4677.6667	0.01	0.06	15.00	AVRG	
Aroclor-1221	850.00000		0.01	-100.00	15.00	AVRG	<-
(2)	1354.5000		0.01	-100.00	15.00	AVRG	<-
(3)	833.00000		0.01	-100.00	15.00	AVRG	<-
(4)	3559.7500		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	3359.0000		0.01	-100.00	15.00	AVRG	<-
(2)	2065.3330		0.01	-100.00	15.00	AVRG	<-
(3)	4580.6670		0.01	-100.00	15.00	AVRG	<-
(4)	2105.0000		0.01	-100.00	15.00	AVRG	<-
(5)	1853.6670		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	2682.5000		0.01	-100.00	15.00	AVRG	<-
(2)	4083.5000		0.01	-100.00	15.00	AVRG	<-
(3)	8557.5000		0.01	-100.00	15.00	AVRG	<-
(4)	3033.0000		0.01	-100.00	15.00	AVRG	<-
(5)	2610.5000		0.01	-100.00	15.00	AVRG	<-

3E
WATER PESTICIDE LAB CONTROL SAMPLE

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Aldrin	0.20	0.19	95	40-120
gamma-BHC (Lindane)	0.20	0.22	110	56-123
4,4'-DDT	0.50	0.88	180 *	38-127
Dieldrin	0.50	0.58	120	52-126
Endrin	0.50	0.48	96	56-121
Heptachlor	0.20	0.21	110	40-131

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 1 out of 6 outside limits

COMMENTS: _____

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RA
Date: 1/14/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: R2788
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).	✓		
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.	✓	[redacted]	

Notes:

	collect	extract	analyzed	collected	extract-	analyzed
EQB-1RE	11/12,02	11/13,02	11/19,02	11/14,02	11/15,02	11/19,02
-3h	4	4	4	4	11/27,02	4
-1h	out of	7 → UJ/h	9 (11/27,02) 8 days 7 days	[redacted]	6 days 6 days	11/24/02
-2h	R-extracted			11/18/02	11/20,02	
			EQB-1RE EQB-2RE grossly → R, h			

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			✓

Notes: See attached Pyrene B, Z in EQB-4, EQB-5

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	✓	✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	✓		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: see attached all ND except pyrene w/pos. bias prev. flagged ✓

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

LCS OKV

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			✓

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes: pyrene 18.3% in EQB-4

Prev. flagged for MB, no more action

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples: 10			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100.			
	% Completeness =			

Notes:

RA

16 compds

CompuChem

a division of Liberty Analytical Corporation
501 Madison Avenue
Cary, N.C. 27513
Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE

SDG R2788
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS: EQB-1, EQB-2, EQB-3, EQB-4, EQB-5, EQB-6, EQB-7, EQB-8

The six water samples listed above were scheduled for the requested analyses of the PAH fraction. SW-846, 3rd Edition, Update 3, Method 8310 was used to analyze these samples, with the exceptions and/or additions requested by the client. All pertinent Quality Assurance Notices are included in the narrative section, and all pertinent Laboratory Notices for SDG R2788 are included in the sample data sections.

Analysis holding time requirements were met for these samples. There were no target analytes reported above the Contract Required Quantitation Limit (CRQL) in these samples. Manual quantitations were performed on one or more of the process files associated with this SDG. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

Overall QC criteria were met for all initial and continuing calibration standards associated to this SDG. All of the surrogates met recovery criteria in the analyses of the samples. The associated method blanks and Laboratory Control Samples met all quality control criteria.

Method blank PBLKVR was inadvertently spiked with the matrix spiking solution during the extraction process. This blank was associated with samples EQB-1, EQB-2, EQB-3, EQB-4 and EQB-5. There were no target compounds detected above the reporting limit in these samples. Pyrene was reported as an estimated value below the reporting limit in samples EQB-4 and EQB-5 ("J" flagged). These samples were also re-extracted outside of holding time and analyzed. There were no target analytes reported in the analyses of the re-extracted samples. Both sets of data have been reported.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Kerry S. Hinshaw
Gas Chromatography Manager
December 19, 2002

4C

EPA SAMPLE NO.

PESTICIDE METHOD BLANK SUMMARY

PBLKVR

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Lab Sample ID: WG21470-1 Lab File ID: 040UWG21470-1

Matrix (soil/water) WATER Extraction:(SepF/Cont/Sonc) SEPF

Sulfur Cleanup (Y/N) N Date Extracted: 11/19/02

Date Analyzed (1): 11/27/02 Date Analyzed (2): 12/14/02

Time Analyzed (1): 1316 Time Analyzed (2): 0818

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column (1): LC-PAH ID: 4.60(mm) GC Column (2): PAH-C16 ID: 4.60(mm

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	PLCSVR	WG21470-2	11/27/02	
02	EQB-1	R2788-3	11/27/02	12/14/02
03	EQB-2	R2788-4	11/27/02	12/14/02
04	EQB-3	R2788-6	11/27/02	12/14/02
05	EQB-4	R2788-8	11/27/02	12/14/02
06	EQB-5	R2788-10	11/27/02	12/14/02
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

COMMENTS: _____

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKVR

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21470-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: _____

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/27/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	2.8	
83-32-9	Acenaphthene	5.3	
86-73-7	Fluorene	2.7	
129-00-0	Pyrene	3.6	
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	3.5	
206-44-0	Fluoranthene	3.7	
218-01-9	Chrysene	3.7	
205-99-2	Benzo(b)fluoranthene	3.5	
207-08-9	Benzo(k)fluoranthene	3.7	
53-70-3	Dibenzo(a,h)anthracene	3.6	
191-24-2	Benzo(g,h,i)perylene	3.8	
56-55-3	Benzo(a)anthracene	3.6	
50-32-8	Benzo(a)pyrene	3.3	
193-39-5	Indeno(1,2,3-cd)pyrene	3.8	
208-96-8	Acenaphthylene	0.59	J

4C

PESTICIDE METHOD BLANK SUMMARY

EPA SAMPLE NO.

PBLKWG

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Lab Sample ID: WG21503-1 Lab File ID: 011WWG21503-1

Matrix (soil/water) WATER Extraction:(SepF/Cont/Sonc) SEPF

Sulfur Cleanup (Y/N) N Date Extracted: 11/20/02

Date Analyzed (1): 12/01/02 Date Analyzed (2): 12/14/02

Time Analyzed (1): 1915 Time Analyzed (2): 0142

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column (1): LC-PAH ID: 4.60(mm) GC Column (2): PAH-C16 ID: 4.60(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	EQB-6	R2788-12	11/27/02	12/14/02
02	EQB-7	R2788-14	11/27/02	12/14/02
03	PLCSWG	WG21503-2	12/01/02	
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
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20				
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22				
23				
24				
25				
26				

COMMENTS:

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKWG

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: WG21503-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: _____

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:11/20/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.073	J
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.2	U
208-96-8	Acenaphthylene	1.2	U

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN76 Calibration Date: 11/27/02 Time: 0915

Lab File ID: 038UPNA4AE Init. Calib. Date(s): 11/26/02 11/26/02

Init. Calib. Times: 1200 1424

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	$\overline{RRF}$ OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1363.7250	1494.9920	0.1	9.62	15.00	AVRG	
Acenaphthene	775.78900	881.79200	0.01	13.66	15.00	AVRG	
Fluorene	5246.3440	5945.9520	0.01	13.34	15.00	AVRG	
Pyrene	5626.4920	6025.0000	0.01	7.08	15.00	AVRG	
Phenanthrene	11854.826	13242.048	0.01	11.70	15.00	AVRG	
Anthracene	19973.544	21209.472	0.01	6.19	15.00	AVRG	
Fluoranthene	3977.5960	4319.4800	0.01	8.60	15.00	AVRG	
Chrysene	13794.464	15708.160	0.01	13.87	15.00	AVRG	
Benzo(b)fluoranthene	9385.2800	10730.800	0.01	14.34	15.00	AVRG	
Benzo(k)fluoranthene	6852.6240	7791.9200	0.01	13.71	15.00	AVRG	
Dibenzo(a,h)anthracene ✓	2652.8320	3066.0000	0.01	15.57	15.00	AVRG	<-
Benzo(g,h,i)perylene ✓	3323.4400	3856.9600	0.01	16.05	15.00	AVRG	<-
Benzo(a)anthracene	8539.8160	9749.0400	0.01	14.16	15.00	AVRG	
Benzo(a)pyrene	8720.5360	9740.8000	0.01	11.70	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7116.6560	8140.2400	0.01	14.38	15.00	AVRG	
Acenaphthylene	1090.3680	1207.1680	0.01	10.71	15.00	AVRG	
p-Terphenyl	4035.6110	4584.4320	0.01	13.60	15.00	AVRG	

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN76 Calibration Date: 11/27/02 Time: 1914

Lab File ID: 050UPNA4AF Init. Calib. Date(s): 11/26/02 11/26/02

Init. Calib. Times: 1200 1424

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	$\overline{RRF}$ OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1363.7250	1518.4960	0.1	11.35	15.00	AVRG	
Acenaphthene	775.78900	866.11200	0.01	11.64	15.00	AVRG	
Fluorene	5246.3440	6208.8000	0.01	18.34	15.00	AVRG	<-
Pyrene	5626.4920	6027.4000	0.01	7.12	15.00	AVRG	
Phenanthrene	11854.826	13170.512	0.01	11.10	15.00	AVRG	
Anthracene	19973.544	20773.488	0.01	4.00	15.00	AVRG	
Fluoranthene	3977.5960	4298.4800	0.01	8.07	15.00	AVRG	
Chrysene	13794.464	15444.720	0.01	11.96	15.00	AVRG	
Benzo(b)fluoranthene	9385.2800	10638.240	0.01	13.35	15.00	AVRG	
Benzo(k)fluoranthene	6852.6240	7661.2800	0.01	11.80	15.00	AVRG	
Dibenzo(a,h)anthracene	2652.8320	3034.9600	0.01	14.40	15.00	AVRG	
Benzo(g,h,i)perylene	3323.4400	3670.8000	0.01	10.45	15.00	AVRG	
Benzo(a)anthracene	8539.8160	9599.6800	0.01	12.41	15.00	AVRG	
Benzo(a)pyrene	8720.5360	9661.2000	0.01	10.79	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7116.6560	8024.9600	0.01	12.76	15.00	AVRG	
Acenaphthylene	1090.3680	1215.7920	0.01	11.50	15.00	AVRG	
p-Terphenyl	4035.6110	4533.3920	0.01	12.33	15.00	AVRG	

2E

WATER PESTICIDE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

GC Column(1): C18 ID: 3.90 (mm)

	EPA SAMPLE NO.	S1 %REC	#	S2 %REC	#	S3 %REC	#	S4 %REC	#	S5 %REC	#	S6 %REC	#	TOT OUT
01	PBLKWY	110												0
02	PLCSWZ	100												0
03	EQB-6	37	*											1
04	EQB-7	93												0
05	EQB-8	110												0
06	PBLKVC	100												0
07	PLCSVD	110												0
08	EQB-1	100												0
09	EQB-2	110												0
10	EQB-3	100												0
11	EQB-4	99												0
12	EQB-5	120												0
13	EQB-6	34	*											1
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														

ADVISORY
QC LIMITS

S1 = 1,4-Dinitrobenzene (50-150)

\# Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

Project Name: Radford SWMU 40/71
Reviewer: RA
Date: 1/15/03

SDG No.: R2788
Project No.: 15295137.10000

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?						
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note:

collected	analyzed	analyzed
11/13/14/02 11/12/02	12/3/4/02 ICP	12/3/02 Hg
11/15/02 11/18/19/02	↓ ↓	

AQuA DV Service

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).						
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%?		✓				
	<50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						

Note:
aluminum 127.9 POS ≤2xCRDL → K,W ✓
antimony 110.8 all ND, no flag
calcium 88.8 ↓ UL,W ✓
copper 83.8 L, UL, W ✓
lead 82 all ND, UL,W ✓
nickel 111.2 POS → K,W ✓
Potassium 65.2 L,UL,W ✓
Se 152.8 all ND, no flag
Silver 145 L,W ✓
Zinc 70.3 UL,W ✓

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L			✓			✓
4.5	Are there reported field blankor trip blank values > ± MDL?						
	Sample Results > MDL						
	< 5X Blank Contamination B						

Note: MB → Ca −66.6, ICB, CCB also neg for Ca all prev flagged-
MB, ICB, CCB pos → Silver all prev. flagged
MB, ICB, CCB neg for zinc, all prev. flagged
CCB → pos. antimony all ND ✓
CCB pos Mg pos → B, O
CCB + Silver prev flagged
+ pos. TL all ND

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note: _____

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.						
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.						

Note: _____

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.						
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?						
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L						
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.						

Note: all samples are blanks.
Yes OK

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?						
10.2	Was a five-fold dilution performed?						
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).						

Note:

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?						
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report						

Note: N;A

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?			✓			✓
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note: _____

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples:_____						
13.1.2	Number of target compounds in each analysis:_____						
13.1.3	Number of results rejected and not reported:_____						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = _____						

Note: _____

CompuChem
A Division of Liberty Analytical Corp.
501 Madison Avenue Cary, NC 27513

INORGANIC CASE SUMMARY NARRATIVE
SDG #R2788
PROTOCOL # SW846

The indicated Sample Delivery Group (SDG) consisting of eight (8) water samples was received into the laboratory management system (LIMS) on November 13, 14, 15, 16, 19, 20, 21, 2002 intact and in good condition. Sample ID's reported in this data package are noted by the receiving department on the COC if they differ from those listed by the samplers on the COC. The samples were received at a temperature of 10 and 12 c. The client was contacted and the lab was instructed to proceed with the indicated analyses.

The samples were analyzed for the metallic TAL list using analytical methods delineated in SW846 update III..
The samples received on 11/13/02 and 11/14/02 were received at temperatures of 6.7 and 1.1 c. respectively. The client instructed the lab to proceed with analysis.

SAMPLE IDs:

The cover page contained in this package lists the client ID's and the associated CompuChem numbers which are part of this SDG.

INSTRUMENTAL QUALITY CONTROL:

The calibration verification solutions (ICV, CCV), blanks (ICB, CCB) associated with this data were confirmed to be within allowable limits.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges. All field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The sample matrix quality control was not requested on this SDG. The samples are blanks.
An LCS was performed.

Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Mary K. Powell
Data Reviewer II
December 12, 2002

Note: This report is paginated for reference and accountability.

2B-IN
CRDL STANDARD FOR AA AND ICP

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

AA CRDL Standard Source: HIPUR

ICP CRDL Standard Source: HIPUR

Concentration Units: ug/L

Analyte	True	Found	%R	CRDL Standard for ICP Initial True	Initial Found	Initial %R	Final Found	Final %R
Aluminum				100.0	127.86	127.9		
Antimony				10.0	11.08	110.8		
Arsenic				10.0	10.44	104.4		
Barium				10.0	9.94	99.4		
Beryllium				5.0	4.88	97.6		
Cadmium				5.0	5.24	104.8		
Calcium				1000.0	888.19	88.8		
Chromium				5.0	5.22	104.4		
Cobalt				5.0	5.10	102.0		
Copper				5.0	4.19	83.8		
Iron				100.0	99.49	99.5		
Lead				3.0	2.46	82.0		
Magnesium				1000.0	992.51	99.3		
Manganese				10.0	9.97	99.7		
Mercury	0.2	0.19	95.0					
Nickel				5.0	5.56	111.2		
Potassium				1000.0	651.82	65.2		
Selenium				5.0	7.64	152.8		
Silver				5.0	7.25	145.0		
Sodium				2000.0	2058.86	102.9		
Thallium				10.0	10.55	105.5		
Vanadium				20.0	19.78	98.9		
Zinc				20.0	14.06	70.3		

Control Limits: no limits have been established by EPA at this time

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

ICP ID Number: P3 Date: 10/15/02

Flame AA ID Number: _____

Furnace AA ID Number: _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.22		100	56.7	P
Antimony	206.84		10	1.2	P
Arsenic	189.04		10	3.0	P
Barium	493.41		10	0.3	P
Beryllium	313.04		5	0.2	P
Cadmium	226.50		5	0.3	P
Calcium	317.93		1000	15.0	P
Chromium	267.72		5	0.8	P
Cobalt	228.62		5	0.7	P
Copper	324.70		5	1.5	P
Iron	271.44		100	12.5	P
Lead	220.35		3	1.2	P
Magnesium	279.08		1000	12.3	P
Manganese	257.61		10	0.2	P
Nickel	231.60		5	1.0	P
Potassium	766.49		1000	40.1	P
Selenium	196.03		5	3.0	P
Silver	328.07		5	0.8	P
Sodium	330.23		2000	304.4	P
Thallium	190.86		10	2.4	P
Vanadium	292.40		20	0.7	P
Zinc	213.86		20	1.1	P

Comments: _____

SW846 METALS

3

BLANKS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	56.7	U	56.7	U	56.7	U	56.7	U	56.700	U	P
Antimony	1.2	U	1.2	U	1.3	B	1.3	B	1.200	U	P
Arsenic	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Barium	0.3	U	0.3	U	0.4	B	0.3	B	0.300	U	P
Beryllium	0.2	U	0.2	B	0.2	U	0.3	B	0.200	U	P
Cadmium	0.3	U	0.4	B	0.3	U	0.4	B	0.300	U	P
Calcium	-64.3	B	-19.6	B	-57.4	B	-20.6	B	-66.619	B	P
Chromium	0.8	U	0.8	U	0.8	U	0.9	B	0.800	U	P
Cobalt	0.7	U	0.7	U	0.7	U	0.7	U	0.700	U	P
Copper	1.5	U	1.5	U	1.5	U	1.5	U	1.500	U	P
Iron	12.5	U	12.7	B	12.5	U	16.4	B	12.500	U	P
Lead	1.2	U	1.2	U	1.2	U	1.2	U	1.200	U	P
Magnesium	12.3	U	41.2	B	12.3	U	50.3	B	12.300	U	P
Manganese	0.2	U	0.2	U	0.2	B	0.3	B	0.200	U	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.100	U	CV
Nickel	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Potassium	40.1	U	40.1	U	40.1	U	40.1	U	40.100	U	P
Selenium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Silver	2.9	B	2.4	B	2.0	B	2.7	B	2.562	B	P
Sodium	304.4	U	304.4	U	304.4	U	304.4	U	304.400	U	P
Thallium	3.5	B	2.4	U	3.5	B	2.4	U	2.400	U	P
Vanadium	0.7	U	0.7	U	0.7	U	0.7	U	0.700	U	P
Zinc	-4.6	B	-4.1	B	-4.5	B	-4.4	B	-2.843	B	P

SW846 METALS

3

BLANKS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum			56.7	U	65.0	B	56.7	U			P
Antimony			1.2	U	1.2	U	1.2	U			P
Arsenic			3.0	U	3.0	U	3.0	U			P
Barium			0.3	U	0.3	U	0.3	U			P
Beryllium			0.2	U	0.3	B	0.3	B			P
Cadmium			0.3	U	0.3	U	0.3	U			P
Calcium			-59.0	B	-46.5	B	-62.0	B			P
Chromium			0.8	U	1.1	B	0.8	U			P
Cobalt			0.7	U	2.7	B	0.7	U			P
Copper			1.5	U	2.2	B	1.5	U			P
Iron			12.5	U	55.4	B	12.5	U			P
Lead			1.2	U	1.2	U	1.2	U			P
Magnesium			12.3	U	39.8	B	12.3	U			P
Manganese			0.2	U	0.2	U	0.2	U			P
Mercury			0.1	U							CV
Nickel			1.0	U	1.0	U	1.0	U			P
Potassium			40.1	U	40.1	U	40.1	U			P
Selenium			3.0	U	3.0	U	3.0	U			P
Silver			2.7	B	3.0	B	2.6	B			P
Sodium			304.4	U	1024.2	B	304.4	U			P
Thallium			2.4	U	2.4	U	2.4	U			P
Vanadium			0.7	U	3.0	B	0.7	U			P
Zinc			-4.5	B	-3.4	B	-3.9	B			P

SW846 METALS

3

BLANKS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1 (10)	C	2 (11)	C	3	C	Preparation Blank	C	M
Aluminum			56.7	U	61.0	B	56.7	U			P
Antimony			1.6	B	1.2	U	1.2	U			P
Arsenic			3.0	U	3.0	U	3.0	U			P
Barium			0.3	U	0.3	U	0.3	U			P
Beryllium			0.2	U	0.3	B	0.2	U			P
Cadmium			0.3	U	0.3	U	0.3	U			P
Calcium			-51.5	B	-42.1	B	-56.5	B			P
Chromium			0.8	U	0.9	B	0.8	U			P
Cobalt			0.7	U	0.7	U	0.7	U			P
Copper			1.5	U	1.5	U	1.5	U			P
Iron			12.5	U	12.5	U	12.5	U			P
Lead			1.2	U	1.2	U	1.2	U			P
Magnesium			12.3	U	28.5	B	12.3	U			P
Manganese			0.2	U	0.3	B	0.2	U			P
Nickel			1.0	U	1.0	U	1.0	U			P
Potassium			40.1	U	40.1	U	40.1	U			P
Selenium			3.0	U	3.0	U	3.0	U			P
Silver			2.1	B	2.5	B	2.3	B			P
Sodium			304.4	U	304.4	U	304.4	U			P
Thallium			3.1	B	2.4	U	3.7	B			P
Vanadium			0.7	U	0.7	U	0.7	U			P
Zinc			-4.3	B	-3.1	B	-3.1	B			P

Samples 1,2 3,4; 5,6; 7,8

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN76 Calibration Date: 11/29/02 Time: 1800

Lab File ID: 010VPNA4AK Init. Calib. Date(s): 11/29/02 11/29/02

Init. Calib. Times: 1244 1510

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	$\overline{RRF}$ OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1351.5250	1596.4320	0.1	18.12	15.00	AVRG	<-
Acenaphthene	842.06200	904.56000	0.01	7.42	15.00	AVRG	
Fluorene	5370.2260	5943.1040	0.01	10.67	15.00	AVRG	
Pyrene	6053.9640	5951.8800	0.01	-1.69	15.00	AVRG	
Phenanthrene	12075.062	13419.552	0.01	11.13	15.00	AVRG	
Anthracene	19348.672	20373.200	0.01	5.30	15.00	AVRG	
Fluoranthene	3916.3400	4325.1200	0.01	10.44	15.00	AVRG	
Chrysene	13752.648	15411.600	0.01	12.06	15.00	AVRG	
Benzo(b)fluoranthene	9175.3920	10444.960	0.01	13.84	15.00	AVRG	
Benzo(k)fluoranthene	6863.3360	7854.0800	0.01	14.44	15.00	AVRG	
Dibenzo(a,h)anthracene	2805.1920	3236.0800	0.01	15.36	15.00	AVRG	<-
Benzo(g,h,i)perylene	3384.0400	4067.2000	0.01	20.19	15.00	AVRG	<-
Benzo(a)anthracene	8392.9040	9511.9200	0.01	13.33	15.00	AVRG	
Benzo(a)pyrene	9094.2640	10322.000	0.01	13.50	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7419.4320	8571.8400	0.01	15.53	15.00	AVRG	<-
Acenaphthylene	1094.6370	1309.6960	0.01	19.65	15.00	AVRG	<-
p-Terphenyl	4002.9010	4511.9200	0.01	12.72	15.00	AVRG	

FORM VII 8310

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN76 Calibration Date: 11/30/02 Time: 0113

Lab File ID: 022VPNA4AL Init. Calib. Date(s): 11/29/02 11/29/02

Init. Calib. Times: 1244 1510

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1351.5250	1555.8400	0.1	15.12	15.00	AVRG	<-
Acenaphthene	842.06200	882.64000	0.01	4.82	15.00	AVRG	
Fluorene	5370.2260	5820.0800	0.01	8.38	15.00	AVRG	
Pyrene	6053.9640	6016.8000	0.01	-0.61	15.00	AVRG	
Phenanthrene	12075.062	13011.392	0.01	7.75	15.00	AVRG	
Anthracene	19348.672	21044.656	0.01	8.76	15.00	AVRG	
Fluoranthene	3916.3400	4515.2000	0.01	15.29	15.00	AVRG	<-
Chrysene	13752.648	15499.840	0.01	12.70	15.00	AVRG	
Benzo(b)fluoranthene	9175.3920	10522.480	0.01	14.68	15.00	AVRG	
Benzo(k)fluoranthene	6863.3360	7843.3600	0.01	14.28	15.00	AVRG	
Dibenzo(a,h)anthracene	2805.1920	3230.4000	0.01	15.16	15.00	AVRG	<-
Benzo(g,h,i)perylene	3384.0400	4050.9600	0.01	19.71	15.00	AVRG	<-
Benzo(a)anthracene	8392.9040	9627.2000	0.01	14.71	15.00	AVRG	
Benzo(a)pyrene	9094.2640	10214.400	0.01	12.32	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7419.4320	8507.2000	0.01	14.66	15.00	AVRG	
Acenaphthylene	1094.6370	1239.9520	0.01	13.28	15.00	AVRG	
p-Terphenyl	4002.9010	4456.9440	0.01	11.34	15.00	AVRG	

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN76 Calibration Date: 12/01/02 Time: 1803

Lab File ID: 009WPNA4AQ Init. Calib. Date(s): 12/01/02 12/01/02

Init. Calib. Times: 1339 1648

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1433.0740	1569.9360	0.1	9.55	15.00	AVRG	
Acenaphthene	829.21400	903.80800	0.01	9.00	15.00	AVRG	
Fluorene	5378.3120	6132.0960	0.01	14.02	15.00	AVRG	
Pyrene	5389.6720	6199.9200	0.01	15.03	15.00	AVRG	<-
Phenanthrene	12312.571	13531.584	0.01	9.90	15.00	AVRG	
Anthracene	20032.056	21130.640	0.01	5.48	15.00	AVRG	
Fluoranthene	4134.7160	4539.0800	0.01	9.78	15.00	AVRG	
Chrysene	14096.704	16063.760	0.01	13.95	15.00	AVRG	
Benzo(b)fluoranthene	9612.3840	10895.280	0.01	13.35	15.00	AVRG	
Benzo(k)fluoranthene	7166.6640	8204.8800	0.01	14.49	15.00	AVRG	
Dibenzo(a,h)anthracene	2872.3600	3350.2400	0.01	16.64	15.00	AVRG	<-
Benzo(g,h,i)perylene	3640.3520	4230.1600	0.01	16.20	15.00	AVRG	<-
Benzo(a)anthracene	8561.6720	10007.120	0.01	16.88	15.00	AVRG	<-
Benzo(a)pyrene	8988.6400	10330.480	0.01	14.93	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7881.9680	8982.8800	0.01	13.97	15.00	AVRG	
Acenaphthylene	1199.0930	1215.0880	0.01	1.33	15.00	AVRG	
p-Terphenyl	4058.2430	4690.5120	0.01	15.58	15.00	AVRG	<-

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN76 Calibration Date: 12/02/02 Time: 0114

Lab File ID: 021WPNA4AR Init. Calib. Date(s): 12/01/02 12/01/02

Init. Calib. Times: 1339 1648

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	$\overline{RRF}$ OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1433.0740	1600.2720	0.1	11.67	15.00	AVRG	
Acenaphthene	829.21400	894.94400	0.01	7.93	15.00	AVRG	
Fluorene	5378.3120	6159.4080	0.01	14.52	15.00	AVRG	
Pyrene	5389.6720	6260.0800	0.01	16.15	15.00	AVRG	<-
Phenanthrene	12312.571	13427.008	0.01	9.05	15.00	AVRG	
Anthracene	20032.056	20980.208	0.01	4.73	15.00	AVRG	
Fluoranthene	4134.7160	4477.4800	0.01	8.29	15.00	AVRG	
Chrysene	14096.704	16249.600	0.01	15.27	15.00	AVRG	<-
Benzo(b)fluoranthene	9612.3840	11132.800	0.01	15.82	15.00	AVRG	<-
Benzo(k)fluoranthene	7166.6640	8440.8000	0.01	17.78	15.00	AVRG	<-
Dibenzo(a,h)anthracene	2872.3600	3183.7600	0.01	10.84	15.00	AVRG	
Benzo(g,h,i)perylene	3640.3520	4189.2800	0.01	15.08	15.00	AVRG	<-
Benzo(a)anthracene	8561.6720	10076.160	0.01	17.69	15.00	AVRG	<-
Benzo(a)pyrene	8988.6400	10759.360	0.01	19.70	15.00	AVRG	<-
Indeno(1,2,3-cd)pyrene	7881.9680	8617.6000	0.01	9.33	15.00	AVRG	
Acenaphthylene	1199.0930	1228.9920	0.01	2.49	15.00	AVRG	
p-Terphenyl	4058.2430	4746.9760	0.01	16.97	15.00	AVRG	<-

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Lab Sample ID: R2788-8 Date(s) Analyzed: 11/27/02 12/14/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.82	13.34	14.34	0.24	
	2	15.90	15.13	16.13	4.9	181.3
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

FORM 6
8330 INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN74 Calibration Date(s): 12/03/02 12/03/02

Column: C18 ID: 3.90 (mm) Calibration Time(s): 0133 0439

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2
HMX	AVRG	1297.24800	17.6
1,3,5-Trinitrobenzene	AVRG	4352.48320	3.9
RDX	AVRG	2468.55040	51.7
1,3-Dinitrobenzene	AVRG	5174.72640	4.6
2,4,6-Trinitrotoluene	AVRG	1325.15200	9.7
Tetryl	AVRG	2891.65440	3.8
Nitrobenzene	AVRG	5783.30880	3.8
2,4-Dinitrotoluene	AVRG	4688.85760	4.7
2,6-Dinitrotoluene	AVRG	2325.08960	7.6
2-Amino-4,6-dinitrotoluene	AVRG	3425.08000	3.2
4-Amino-2,6-dinitrotoluene	AVRG	2309.55840	7.1
2-Nitrotoluene	AVRG	2101.16000	3.5
4-Nitrotoluene	AVRG	1735.74720	6.6
3-Nitrotoluene	AVRG	2236.08800	4.0
1,4-Dinitrobenzene	AVRG	4070.83040	3.7

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN74 Calibration Date: 11/20/02 Time: 2157

Lab File ID: 040NFULL4SX Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
HMX	1319.6830	1205.6000	1205.6000	0.01	-8.64	15.00	AVRG
1,3,5-Trinitrobenzene	3649.5740	3758.6240	3758.6240	0.01	2.99	15.00	AVRG
RDX	27.199638	31.250000	1407.5200	0.01	12.96		LINR
1,3-Dinitrobenzene	4880.9730	5515.8400	5515.8400	0.01	13.01	15.00	AVRG
2,4,6-Trinitrotoluene	2567.0750	2192.8000	2192.8000	0.01	-14.58	15.00	AVRG
Tetryl	3844.6050	3433.5840	3433.5840	0.01	-10.69	15.00	AVRG
Nitrobenzene	7689.2100	6867.1680	6867.1680	0.01	-10.69	15.00	AVRG
2,4-Dinitrotoluene	3994.7010	4086.2080	4086.2080	0.01	2.29	15.00	AVRG
2,6-Dinitrotoluene	2601.4990	2594.2400	2594.2400	0.01	-0.28	15.00	AVRG
2-Amino-4,6-dinitrotoluene	3266.3100	3103.1520	3103.1520	0.01	-5.00	15.00	AVRG
4-Amino-2,6-dinitrotoluene	50.484693	62.500000	2430.8000	0.01	19.22		LINR
2-Nitrotoluene	1987.5310	1900.7040	1900.7040	0.01	-4.37	15.00	AVRG
4-Nitrotoluene	1448.9760	1570.0480	1570.0480	0.01	8.36	15.00	AVRG
3-Nitrotoluene	1945.6140	1913.9360	1913.9360	0.01	-1.63	15.00	AVRG
1,4-Dinitrobenzene	3915.6410	3680.0880	3680.0880	0.01	-6.02	15.00	AVRG

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN74 Calibration Date: 11/21/02 Time: 0714

Lab File ID: 052NFULL4SY Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 ** 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	$\overline{RRF}$ or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1193.1200	1193.1200	0.01	-9.59	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	3691.3600	3691.3600	0.01	1.14	15.00	AVRG	
RDX	32.105656	31.250000	1639.6480	0.01	-2.74		LINR	
1,3-Dinitrobenzene	4880.9730	5663.6800	5663.6800	0.01	16.04	15.00	AVRG	<-
2,4,6-Trinitrotoluene	2567.0750	2473.5360	2473.5360	0.01	-3.64	15.00	AVRG	
Tetryl	3844.6050	3285.2320	3285.2320	0.01	-14.55	15.00	AVRG	
Nitrobenzene	7689.2100	6570.4640	6570.4640	0.01	-14.55	15.00	AVRG	
2,4-Dinitrotoluene	3994.7010	4325.7920	4325.7920	0.01	8.29	15.00	AVRG	
2,6-Dinitrotoluene	2601.4990	2549.9680	2549.9680	0.01	-1.98	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3210.3200	3210.3200	0.01	-1.71	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	50.601547	62.500000	2437.2160	0.01	19.04		LINR	
2-Nitrotoluene	1987.5310	1854.8960	1854.8960	0.01	-6.67	15.00	AVRG	
4-Nitrotoluene	1448.9760	1590.8000	1590.8000	0.01	9.79	15.00	AVRG	
3-Nitrotoluene	1945.6140	1983.9840	1983.9840	0.01	1.97	15.00	AVRG	
1,4-Dinitrobenzene	3915.6410	3798.5840	3798.5840	0.01	-2.99	15.00	AVRG	

FORM VII 8330

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN74 Calibration Date: 11/21/02 Time: 1439

Lab File ID: 060NFULL4SZ Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1248.2240	1248.2240	0.01	-5.41	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	3736.8000	3736.8000	0.01	2.39	15.00	AVRG	
RDX	32.595987	31.250000	1662.8480	0.01	-4.31		LINR	
1,3-Dinitrobenzene	4880.9730	5129.6320	5129.6320	0.01	5.09	15.00	AVRG	
2,4,6-Trinitrotoluene ✓	2567.0750	2071.2000	2071.2000	0.01	-19.32	15.00	AVRG	<-
Tetryl	3844.6050	3616.8480	3616.8480	0.01	-5.92	15.00	AVRG	
Nitrobenzene	7689.2100	7233.6960	7233.6960	0.01	-5.92	15.00	AVRG	
2,4-Dinitrotoluene	3994.7010	4282.9120	4282.9120	0.01	7.21	15.00	AVRG	
2,6-Dinitrotoluene	2601.4990	2475.5040	2475.5040	0.01	-4.84	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3407.9520	3407.9520	0.01	4.34	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	50.021647	62.500000	2405.3760	0.01	19.96		LINR	
2-Nitrotoluene	1987.5310	2060.8000	2060.8000	0.01	3.69	15.00	AVRG	
4-Nitrotoluene	1448.9760	1720.1120	1720.1120	0.01	18.71	15.00	AVRG	<-
3-Nitrotoluene	1945.6140	2191.1200	2191.1200	0.01	12.62	15.00	AVRG	
1,4-Dinitrobenzene	3915.6410	4122.1920	4122.1920	0.01	5.28	15.00	AVRG	

UJC

FORM VII 8330

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN74 Calibration Date: 12/03/02 Time: 0612

Lab File ID: 008HFULL4GC Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1374.8160	0.01	5.98	15.00	AVRG	
1,3,5-Trinitrobenzene	4352.4830	4651.9040	0.01	6.88	15.00	AVRG	
RDX	2468.5500	1723.1680	0.01	-30.20	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5381.1840	0.01	3.99	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1475.5840	0.01	11.35	15.00	AVRG	
Tetryl	2891.6540	2940.0800	0.01	1.67	15.00	AVRG	
Nitrobenzene	5783.3090	5880.1600	0.01	1.67	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	4890.0480	0.01	4.29	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2401.5680	0.01	3.29	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3562.5120	0.01	4.01	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2410.7040	0.01	4.38	15.00	AVRG	
2-Nitrotoluene	2101.1600	2190.6720	0.01	4.26	15.00	AVRG	
4-Nitrotoluene	1735.7470	1846.0640	0.01	6.36	15.00	AVRG	
3-Nitrotoluene	2236.0880	2336.2240	0.01	4.48	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4187.1360	0.01	2.86	15.00	AVRG	

prev flags

FORM VII 8330

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN74 Calibration Date: 12/03/02 Time: 1529

Lab File ID: 020HFULL4GD Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1647.7120	0.01	27.02	15.00	AVRG	<-
1,3,5-Trinitrobenzene	4352.4830	4536.7360	0.01	4.23	15.00	AVRG	
RDX	2468.5500	1805.1520	0.01	-26.87	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5414.3360	0.01	4.63	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1601.6960	0.01	20.87	15.00	AVRG	<-
Tetryl	2891.6540	2815.9520	0.01	-2.62	15.00	AVRG	
Nitrobenzene	5783.3090	5631.9040	0.01	-2.62	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	5065.4080	0.01	8.03	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2478.8640	0.01	6.61	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3684.9120	0.01	7.59	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2426.6240	0.01	5.07	15.00	AVRG	
2-Nitrotoluene	2101.1600	2215.0240	0.01	5.42	15.00	AVRG	
4-Nitrotoluene	1735.7470	1885.8080	0.01	8.64	15.00	AVRG	
3-Nitrotoluene	2236.0880	2385.7760	0.01	6.69	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4232.4480	0.01	3.97	15.00	AVRG	

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FORM VII 8330

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN74 Calibration Date: 12/13/02 Time: 1419

Lab File ID: 013PFULL4AH Init. Calib. Date(s): 12/12/02 12/13/02

Init. Calib. Times: 2230 0216

GC Column: PINNACLE CYANO ID: 3.90 (mm)

COMPOUND	$\overline{RRF}$ or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1011.4050	1156.0960	1156.0960	0.01	14.30	15.00	AVRG	
1,3,5-Trinitrobenzene	1710.5300	1335.3120	1335.3120	0.01	-21.94	15.00	AVRG	<-
RDX	1553.2290	1588.3200	1588.3200	0.01	2.26	15.00	AVRG	
1,3-Dinitrobenzene	2357.8940	2809.8240	2809.8240	0.01	19.17	15.00	AVRG	<-
2,4,6-Trinitrotoluene	10352.176	10916.480	10916.480	0.01	5.45	15.00	AVRG	
Tetryl	675.77000	738.22400	738.22400	0.01	9.24	15.00	AVRG	
Nitrobenzene	2795.6960	2755.2960	2755.2960	0.01	-1.44	15.00	AVRG	
2,4-Dinitrotoluene	4004.4930	4024.9280	4024.9280	0.01	0.51	15.00	AVRG	
2,6-Dinitrotoluene	2176.9630	2299.8720	2299.8720	0.01	5.64	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	5176.0880	5458.2400	5458.2400	0.01	5.45	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	5176.0880	5458.2400	5458.2400	0.01	5.45	15.00	AVRG	
2-Nitrotoluene	3537.9570	3911.5360	3911.5360	0.01	10.56	15.00	AVRG	
4-Nitrotoluene	3537.9570	3911.5360	3911.5360	0.01	10.56	15.00	AVRG	
3-Nitrotoluene	1381.5170	1085.5360	1085.5360	0.01	-21.42	15.00	AVRG	<-
1,4-Dinitrobenzene	124.05046	125.00000	3147.4960	0.01	0.76		LINR	

UJ,C

FORM VII 8330

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

Instrument ID: VARIAN74 Calibration Date: 12/13/02 Time: 2057

Lab File ID: 020PFULL4AI Init. Calib. Date(s): 12/12/02 12/13/02

Init. Calib. Times: 2230 0216

GC Column: PINNACLE CYANO ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1011.4050	1151.6800	1151.6800	0.01	13.87	15.00	AVRG	
1,3,5-Trinitrobenzene	1710.5300	1243.3600	1243.3600	0.01	-27.31	15.00	AVRG	<-
RDX	1553.2290	1614.3360	1614.3360	0.01	3.93	15.00	AVRG	
1,3-Dinitrobenzene	2357.8940	2916.6080	2916.6080	0.01	23.70	15.00	AVRG	<-
2,4,6-Trinitrotoluene	10352.176	10839.680	10839.680	0.01	4.71	15.00	AVRG	
Tetryl	675.77000	700.64000	700.64000	0.01	3.68	15.00	AVRG	
Nitrobenzene	2795.6960	2737.2480	2737.2480	0.01	-2.09	15.00	AVRG	
2,4-Dinitrotoluene	4004.4930	3970.1760	3970.1760	0.01	-0.86	15.00	AVRG	
2,6-Dinitrotoluene	2176.9630	2201.1680	2201.1680	0.01	1.11	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	5176.0880	5419.8400	5419.8400	0.01	4.71	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	5176.0880	5419.8400	5419.8400	0.01	4.71	15.00	AVRG	
2-Nitrotoluene	3537.9570	3903.9520	3903.9520	0.01	10.34	15.00	AVRG	
4-Nitrotoluene	3537.9570	3903.9520	3903.9520	0.01	10.34	15.00	AVRG	
3-Nitrotoluene	1381.5170	1070.8000	1070.8000	0.01	-22.49	15.00	AVRG	<-
1,4-Dinitrobenzene	122.35428	125.00000	3102.7440	0.01	2.12		LINR	

FORM VII 8330

2E
WATER PESTICIDE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

GC Column(1): C18 ID: 3.90 (mm)

	EPA SAMPLE NO.	S1 1 %REC	#	S1 2 %REC	#	S2 1 %REC	#	S2 2 %REC	#	S3 1 %REC	#	S3 2 %REC	#	TOT OUT
01	PBLKVC	86												0
02	PLCSVC	97												0
03	EQB-1	92												0
04	EQB-3	95												0
05	EQB-4	110												0
06	EQB-5	100												0
07	PBLKWY	110												0
08	EQB-6	34	*	34*										2
09	EQB-7	87												0
10	EQB-8	100												0
11	PBLKAY	100												0
12	PLCSAY	93												0
13	PLCSWY	97												0
14	EQB-2	110												0
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														

ADVISORY
QC LIMITS

S1 = 1,4-Dinitrobenzene (39-132)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

3E

WATER PESTICIDE LAB CONTROL SAMPLE

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2788

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
HMX	7.8	5.4	69	50-150
1,3,5-Trinitrobenzene	5.2	2.5	48 *	50-150
RDX	5.2	2.6	50	50-150
1,3-Dinitrobenzene	5.2	3.3	63	50-150
2,4,6-Trinitrotoluene	5.2	4.3	83	50-150
Tetryl	7.8	5.1	65	50-150
Nitrobenzene	5.2	2.6	50	50-150
2,4-Dinitrotoluene	5.2	3.4	65	50-150
2,6-Dinitrotoluene	7.8	6.5	83	50-150
2-Amino-4,6-dinitrotolu	7.8	6.8	87	50-150
4-Amino-2,6-dinitrotolu	7.8	6.2	79	50-150
2-Nitrotoluene	7.8	6.5	83	50-150
4-Nitrotoluene	7.8	6.8	87	50-150
3-Nitrotoluene	7.8	6.3	81	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 1 out of 14 outside limits

COMMENTS: _____

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 11/19/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: R2788
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

	collected	extract	analyzed
	11/12/02	11/18/02	11/21/02, 12/13/02
11/14,15/02	11/13/02	〃	〃
11/19/02, 11/18/02		11/22/02	12/3/02

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			✓

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: IC 124302 RDX 51.7% RSD → UJ/R in ass. samples.
CC see attached 2,4,6-trinitrotoluene UJ/C " "

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: EQB-6 1,4-dinitrobenzene 34% L39-132
UL/S unless prev.

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes: 1,3,5-trinitrobenzene 48% < 50-150%
R,L in all

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		✓	

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples: 8			
10.1.3	Number of results rejected and not reported: 8			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness = 92%			

Notes:

compds = 14

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: _____
Date: _____
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: R2788
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

	Collect	Extract	Analyzed
11/14,02, 11/13,02,	11/12,02	11/18,02	11/26,02
	11/15,02	〃	〃
11/19,20,02	11/18,02	11/22,02	〃

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			✓

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			✓
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			✓
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: 1,4-dinitrobenzene 37% EQB-6
34% ULS

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		✓	

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			
	% Completeness = _____			

Notes:

DATA VALIDATION REPORT - Level III Review

SDG No.: _____S2788_____ **Fraction:**_VOCs, SVOCs, Pest., PCBs, PAH,___ __Explosives, Nitroglycerin, Metals___

Lab: _CompuChem_____ **Project Name:** __Radford SWMU 40/71_____

Reviewer: _____RA, AJ_____ **Date:** _____February 25, 2003_____

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the VOC analyses, severe loss of internal standard 1,4-dichlorobenzene was observed in sample 40SB7F. All associated sample results were non-detects and were flagged "R,i." This sample was re-analyzed with similar results. The original sample results should be used for data interpretations. Severe loss of internal standards was observed in samples 40SB3A, 40SB6A, 40SB6F, D-3 and D-4. All results were flagged "R,i" in these samples. These samples were re-analyzed with acceptable recoveries and results from the re-analyses should be used for these samples.

For the SVOC analyses, the CCV analyzed on 11/26/02 at 0856 displayed a %D greater than the control limit (i.e., 20%) with a negative bias for atrazine at 58.9%. Non-detects were flagged "R,c" in the associated samples.

Minor Anomalies: For the VOC analyses, the method blanks contained toluene at 1 ug/Kg, 2 ug/Kg, 4 ug/Kg, and 130 ug/Kg, 1,1,2-trifluoro-1,2,2-trifluoroethane at 1 ug/Kg, 1,2,4-trichlorobenzene at 1ug/Kg, 4 ug/Kg, and 51 ug/Kg, 1,3-dichlorobenzene at 0.5 ug/Kg and 0.3 ug/Kg, 1,2-dichlorobenzne at 0.5 ug/Kg and 0.3 ug/Kg, 1,4-dichlorobenzene at 0.4 ug/Kg and 0.3 ug/Kg, and bromomethane at 1 ug/Kg and 50 ug/Kg. Positive results less than 5 times the blank concentration were flagged "B,z" in the associated samples. The trip and equipment blanks were located in SDG R2788. These blanks contained positive results for toluene, 1,2,4-trichlorobenzene and methylene chloride. Positive methylene chloride results less than 10 times the blank concentration were flagged "B,x" in the associated samples. Positive toluene and 1,2,4-trichlorobenzene results in the associated samples were either previously flagged due to method blank contamination or were greater than 5 times the blank concentration and no further data qualifying action was required.

Samples 40SB4CRE, 40SB3ARE, 40SB3BRE, 40SB3CRE, 40SB4BRE, 40SB6ARE, 40SB6FRE, 40SB6CRE, D-2RE, D-3RE, and D-4RE were analyzed one day outside the holding time. Positive results were flagged "L,h" and non-detects were flagged "UL,h" unless previously flagged due to other anomalies. These samples were re-analyzed since the internal standard recoveries were outside the QC limit for the original sample analyses.

The recoveries for internal standards fluorobenzene and chlorobenzene were less than the lower QC limit in sample 40SB7F. The recoveries for internal standard fluorobenzene were less than the lower QC limit in samples 40SB4B, 40SB4C, 40SB3B, and 40SB3C. Positive associated results were flagged "J,i" and non-detects were flagged "UJ,i" unless previously flagged due to other anomalies. This sample was re-analyzed with similar results. The original sample results should be used for data interpretations. The recoveries for internal standard 1,4-dichlorobenzene were less than the lower QC limit in samples D-2, 40SB6C and D-2RE. Positive associated results were flagged "J,i" and non-detects were flagged "UJ,i" unless previously flagged due to other anomalies. The original sample results should be used for data interpretations since the samples were re-analyzed outside the holding time.

The CCV analyzed on 11/27/02 at 1017 displayed a %D greater than the control limit (i.e., 20%) with a negative bias for bromomethane at 21.4%. Non-detects were flagged "UJ,c" in the associated samples.

The CCV analyzed on 11/28/02 at 1236 displayed %Ds greater than the control limit with a negative bias for dichlorodifluoromethane at 28.2%, chloromethane at 25.0%, 2-butanone at 22.2% and methyl acetate at 28.0%. Positive results were flagged "J,c" and non-detects were flagged "UJ,c" in the associated samples.

The CCV analyzed on 11/29/02 at 1124 displayed %Ds greater than the control limit with a positive bias for chloroethane at 21.5%, styrene at 20.6%, 1,2-dibromo-3-chloropropane at 28.1%, and methylcylcohexane at 22.0%. All associated sample results were previously flagged due to other anomalies and no further data qualifying action was required.

The recoveries for one or more surrogates were greater than the upper QC limit in samples 40SB7F, 40SB6A, 40SB6F, 40SB7FRE, D-3, 40SB4B, 40SB4C, D-4, 40SB3A, 40SB3B, and 40SB3C. Positive results were flagged "K,s" in samples 40SB4B, 40SB4C, 40SB3B, and 40SB3C. No data flags were applied to the other samples since they were either previously flagged due to other anomalies or were not used for data interpretations.

The MS recovery for acetone (47%) was less than the lower QC limit. This result was previously flagged in the parent sample 40SB3B and no further data qualifying action was required.

The %RPDs for acetone, 2-butanone and total xylene were greater than the QC limit in the field duplicate pair 40SB7F/D-2. The %RPD for acetone was greater than the QC limit in the field duplicate pair 40SB4C/D-4. No action is required based on field duplicate anomalies and no data flags were applied.

For the SVOC analyses, the initial calibration analyzed on 11/7/02 displayed %RSDs greater than the control limit (i.e., 15%) for benzaldehyde at 17.8%, bis (2-chloroethyl)ether at 17.88%, 4-methylphenol at 21.06%, 2,4,5-trichlorophenol at 15.23%, 2,2-oxybis(1-chloropropane) at 28.3%, n-nitroso-di-n-propylamine at 17.5%, hexachloroethane at 17.7%, naphthalene at 15.3%, 4-chlroro-3-methylphenol at 15.3%, 2-methyl naphthalene at 16.1%, dimethylphthalate at 15.8%, acenapthylene at 22.3%, acenaphthene at 24.4%, dibenzofuran at 20.9%, fluorene at 18.6%, 4,6-dinitro-2-methylphenol at 17.3%, n-nitrosodiphenylamine at 24.9%, 4-bromophenyl-phenylether at 15.8%, atrazine at 57.9%, pentachlorophenol at 15.9%, phenanthrene at 16.2%, anthracene at 15.7%, carbazole at 15.5%, 3,3-dichlorobenzidine at 16.4%, chrysene at 16.5%, benzo(k)fluoranthene at 23.6%, and dibenzo(a,h)anthracene at 16.9%. Non-detects were flagged "UJ,r" for atrazine since the failure was serious enough (i.e., > 50%) to affect the non-detects. Positive results were flagged "J,r" for the other compounds in the associated samples. The initial calibration analyzed on 11/25/02 displayed %RSDs greater than the control limit for benzaldehyde at 18.8%, bis(2-chloroethoxy)methane at 17.4%, %, n-nitrosodiphenylamine at 15.8% and atrazine at 69.7%. Positive results were flagged "J,r" unless previously flagged due to other anomalies.

The CCV analyzed on 11/19/02 at 0949 displayed %Ds greater than the control limit (i.e., 20%) with a negative bias for atrazine at 24.79%, and with a positive bias for 3,3-dichlorobenzidine at 25.2% and benzo(b)fluoranthene at 20.67%. All associated sample results were non-detects for 3,3-dichlorobenzidine and benzo(b)fluoranthene and no data qualifying action was required. Atrazine results were previously flagged and no further data qualifying action was required.

The CCV analyzed on 11/20/02 at 1939 displayed a %D greater than the control limit with a positive bias for 4-chlorophenyl-phenylether at 28.3% and with a negative bias for atrazine at 31.3%. Atrazine results were previously flagged and no positive results were reported for 4-chlorophenyl-phenylether. No further data qualifying action was required.

The CCV analyzed on 11/22/02 at 1019 displayed a %D greater than the control limit with a negative bias for atrazine at 35.8%, and with a positive bias for hexachlorocyclopentadiene at 35.6%, 2,4-dinitrophenol at 25.6%, 4-chlorophenyl-phenylether at 22.6%, and 4,6-dinitro-2-methylphenol at 22.5%. Atrazine non-detects were flagged "UJ,c" in the associated samples. Positive results were flagged "J,c" for the other compounds in the associated samples.

The CCV analyzed on 11/26/02 at 0856 displayed a %D greater than the control limit with a negative bias for bis(2-chloroethoxy)methane at 22.4%. Non-detects were flagged "UJ,c" in the associated samples.

The MS/MSD pair for sample 40SB3B displayed recoveries for 4-chloro-3-methylphenol (130%/150%), the MSD recoveries for 2-nitrophenol (120%), 2,4-dimethylphenol (140%), and 2,4-dichlorophenol (130%) which were greater than the upper QC limit. No positive results were reported for these compounds and no data qualifying action was required.

The LCS recoveries were greater than the upper QC limits for phenol (160%), 2-chlorophenol (149%), 4-methylphenol (101%), 2-nitrophenol (166%), 2,4-dimethylphenol (176%), 2,4-dichlorophenol (191%), naphthalene (120%), 4-chloro-3-methylphenol (177%), 3-nitroaniline (118%), fluorene (130%), n-nitrosodiphenylamine (130%), and pantachlorophenol (168%). Positive results were flagged "J,l" in the associated samples.

The %RPD for bis(2-ethylhexyl)phthalate was greater than the QC limit in the field duplicate pair 40SB7F/D-2. No action is required based on field duplicate anomalies and no data flags were applied.

For the pesticides analyses, the CCV analyzed on 11/28/02 at 0119 displayed %Ds greater than the control limit (i.e., 15%) with a positive bias for delta-BHC at 17.79% and endosulfan sulfate at 25.72%. No positive results were reported for these compounds in the associated samples and no data qualifying action was taken.

The CCV analyzed on 11/27/02 at 1707 displayed %Ds greater than the control limit with a positive bias for delta-BHC at 15.11% and endosulfan sulfate at 20.81%. No positive results were reported for these compounds in the associated samples and no data qualifying action was taken.

The CCV analyzed on 11/28/02 at 0528 displayed %Ds greater than the control limit with a positive bias for delta-BHC at 16.13% and endosulfan sulfate at 23.89%. No positive results were reported for these compounds in the associated samples and no data qualifying action was taken.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for several compounds in several samples. These results were flagged "J,g."

For the PCB analyses, the recovery for surrogate tetrachloro-m-xylne in sample D-3 (383%) was greater than the upper QC limit. No action is required based on one surrogate failure and no data flags were applied.

The %RPD for PCB–1254 was greater than the QC limit in the field duplicate pair 40SB7F/D-2. No action is required based on field duplicate anomalies and no data flags were applied.

PCB-1254 exceeded the calibration range in sample D-3 and was flagged "E" by the laboratory. This result was flagged "J,q." This sample was re-analyzed at a dilution factor of 5 with acceptable results and the result from dilution analysis should be used for this compound.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for several compounds in several samples. These results were flagged "J,g."

For the PAH analyses, the method blank contained pyrene at 12 ug/Kg and benzo(b)flouranthene at 43 ug/Kg. Positive results less than 5 times the blank concentration were flagged "B,z."

The CCV analyzed on 11/19/02 at 0426 displayed %Ds greater than the control limit (i.e., 15%) with a positive bias for pyrene at 16.48%, benzo(b)fluoranthene at 15.34%, and acenaphthylene at 18.63%. The CCV analyzed on 11/21/02 at 0059 displayed %Ds greater than the control limit with a positive bias for fluorene at 16.88% and benzo(g,h,i)perylene at 15.39%. The CCV analyzed on 11/21/02 at 0735 displayed %Ds greater than the control limit with a positive bias for benzo(g,h,i)perylene at 18.08% and acenaphthylene at 15.39%. The CCV analyzed on 11/21/02 at 1410 displayed a %D greater than the control limit with a positive bias for acenaphthene at 17.78%. The CCV analyzed on 11/22/02 at 0958 displayed a %D greater than the control limit with a positive bias for acenaphthylene at 15.99%. The CCV analyzed on 11/22/02 at 1301 displayed %Ds greater than the control limit with a positive bias for fluorene at 17.27% and acenaphthylene at 19.44%. The CCV analyzed on 11/24/02 at 0457 displayed a %D greater than the control limit with a positive bias for acenaphthene at 19.38% and dibenzo(a,h)anthracene at 16.14%. The CCV analyzed on 11/24/02 at 1209 displayed %Ds greater than the control limit with a positive bias for acenaphthene at 17.38%, benzo(k)fluoranthene at 30.64%, and dibenzo(a,h)anthracene at 23.76% and with a negative bias for benzo(b)fluoranthene at 17.66%. The CCV analyzed on 11/25/02 at 2325 displayed a %D greater than the control limit with a positive bias for acenaphthene at 18.6%. The CCV analyzed on 11/26/02 at 0524 displayed %Ds greater than the control limit with a positive bias for fluorene at

15.48% and acenaphthylene at 15.48%. Positive results were flagged "J,c" for the failures with a positive bias and non-detects were flagged "UJ,c" for the failures with a negative bias in the associated samples.

The surrogate recoveries for p-terphenyl were less than the lower QC limit in samples 40SB10A and 40SB7A. Positive results were flagged "L,s" and non-detects were flagged "UL,s." The surrogate recoveries for p-terphenyl were greater than the upper QC limit in samples 40SB8C, 40SB6F, D-2, D-3 and 40SB7F. Positive results were flagged "K,s" in the these samples unless previously flagged due to other anomalies.

The %RPD for naphthalne (28%) and benzo(k)fluoranthene (34%) were less than the lower QC limit. Positive results were flagged "J,d" unless previously flagged due to other anomalies.

Several compounds exceeded the calibration range of the instrument and were flagged "E" by the laboratory. These results were flagged "J,q" unless previously flagged due to other anomalies. The associated samples were not analyzed at higher dilution factors since the laboratory originally reported the lower results between the two columns. The new Form Is provided by the laboratory, report the higher results.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for several compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

For the explosive analyses, one method blank contained HMX at 0.38 mg/Kg. No positive results were reported in the associated samples and no data qualifying action was taken.

The continuing calibration analyzed on 11/21/02 at 1439 displayed %Ds greater than the QC limit (i.e., 15%) with a negative bias for 2,4,6-trinitrotoluene at 19.32% and with a positive bias for 4-amino-2,6-dinitrotoluene at 19.96% and 4-nitrotoluene at 18.71%. Non-detects were flagged "UJ,c" for 2,4,6-trinitrotoluene in the associated samples. No positive results were reported for 4-nitrotoluene and 4-amino-2,6-dinitrotoluene in the associated samples and no data qualifying action was taken. The continuing calibration analyzed on 11/22/02 at 0100 displayed a %D greater than the QC limit with a positive bias for 4-nitrotoluene at 20.32%. No positive results were reported and no data qualifying action was taken. The continuing calibration analyzed on 11/22/02 at 2331 displayed a %D greater than the QC limit with a negative bias for 2,4,6-trinitrotoluene at 35.98% and with a positive bias for 4-nitrotoluene at 21.96%, 3-nitrotoluene at 17.56% and 2,4-dinitrotoluene at 23.49%. The continuing calibration analyzed on 11/23/02 at 0909 displayed a %D greater than the QC limit with a negative bias

for 2,4,6-trinitrotoluene at 18.95% and with a positive bias for 1,3,5-trinitrobenzne at 17.38%, 1,3-dinitrobenzene at 23.32%, 4-nitrotoluene at 29.3%, 3-nitrotoluene at 25.49% and 2,4-dinitrotoluene at 32.01%. Non-detects were flagged "UJ,c" for 2,4,6-trinitrotoluene in the associated samples. No positive results were reported for the other compounds and no data qualifying action was taken.

The MSD recovery for 1,3,5-trinitrobenzene (48%) was less than the lower QC limit (i.e., 50%). This result was flagged "UJ,m" in the parent sample 40SB3B.

For the metal analyses, the method blanks contained a negative result for calcium and positive results for barium, magnesium and zinc. All associated sample results were positive and were greater than 5 times the blank concentration. No data flags were applied. The equipment blanks located in SDG R2788 contained barium, iron and sodium at low concentrations. Positive sodium results less than 5 times the blank concentration were flagged "B,x" in the associated samples. Positive barium and iron results were greater than 5 times the blank concentration and no data qualifying action was required. The initial and continuing calibration blanks also contained positive results for calcium, aluminum, barium, beryllium, iron, magnesium and zinc. All associated sample results were either greater than 5 times the blank concentration or were previously flagged. No further data qualifying action was required.

The initial CRDL percent recoveries for aluminum (136.6%), antimony (124%), arsenic (131%), barium (112%), beryllium (116%), cadmium (115%), cobalt (112%), lead (126%), potassium (122%), selenium (121%) and thallium (118%) were greater than the upper QC limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "K,w" unless previously flagged due to other anomalies.

The %RPDs for the laboratory duplicates were greater than the QC limit (i.e., 35%) for magnesium (55.4%) and potassium (38.1%). Positive results were flagged "J,k" unless previously flagged due to other anomalies.

The MS and or MSD recoveries for antimony (33.7%/34.4%), arsenic (74.2%), barium (69.4%/74.7%), beryllium (74.6%/73.6%), cadmium (70.9%/73.7%), chromium (62.8%), cobalt (74.5%), copper (66.2%), nickel (70.2%), selenium (46.6%/39.9%), thallium (30.5%/39.8%), vanadium (74.6%), and zinc (70.8%) were less than the lower control limit (i.e., 75-125%). Positive results were flagged "L,m" and non-detects were flagged "UL,m" unless previously flagged due to other anomalies.

The serial dilution %Ds for barium (31.2%), beryllium (33.5%), calcium (36.1%), chromium (32.4%), cobalt (33.2%), copper (42.8%), iron (35.6%), magnesium (32.5%), manganese (34.7%), nickel (37.1%), potassium (27.1%), vanadium

(30.8%) and zinc (39%) were greater than the QC limit (i.e., 10%). Positive results were flagged "J,s" unless previously flagged due to other anomalies.

The %RPDs for aluminum, arsenic, barium, cadmium, calcium, copper, iron, magnesium, manganese, potassium, silver, sodium, and vanadium were greater than the QC limit in the field duplicate pair 40SB7F/D-2. No action is required based on field duplicate anomalies and no data flags were applied.

Correctable Anomalies: Samples 40SB3A, 40SB3B, 40SB3C, 40SB4B, 40SB4C, D-3, and D-4 were not listed on the chain of custodies.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were raised.

It should be noted that the positive TIC results were flagged "NJ,t" in the associated samples. It should be noted that if a given fraction (analysis) is not discussed in this report, it indicates that no anomalies were observed for that fraction. Except for data flagged "R", all data as qualified, are usable for their intended purpose based on the data reviewed.

Samples 40SB6A, 40SB6C, 40SB6F, 40SB7B, 40SB7C, 40SB7F, 40SB8C and D-2 were received in a cooler that was chilled to 1.1 degrees C, below the 2.0 degrees QC limit. No data qualifying action was taken since the samples were not frozen.

Signed: Ranjan

COC #

SAMPLENUM	CLIENTID	QUOTENUMREF	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
S2788-1	40SB10A	Q2788 1013	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-3	40SB10B	Q2788 1013	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-4	40SB10C	Q2788 1013	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-2	40SB10F	Q2788 1013	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-18	40SB3A	Q2788 ?1101	S2788	SO	URS	RADFORD SWMU 40/71	11/15/02
S2788-19	40SB3B	Q2788 ?	S2788	SO	URS	RADFORD SWMU 40/71	11/15/02
S2788-20	40SB3C	Q2788 ?	S2788	SO	URS	RADFORD SWMU 40/71	11/15/02
S2788-15	40SB4B	Q2788 ?1100	S2788	SO	URS	RADFORD SWMU 40/71	11/15/02
S2788-16	40SB4C	Q2788 ?	S2788	SO	URS	RADFORD SWMU 40/71	11/15/02
S2788-11	40SB6A	Q2788 1014	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-13	40SB6C	Q2788 1014	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-12	40SB6F	Q2788 1014	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-6	40SB7A	Q2788 1014	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-8	40SB7B	Q2788 1014	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-9	40SB7C	Q2788 1014	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-7	40SB7F	Q2788 1014	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-5	40SB8C	Q2788 1014	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-10	D-2	Q2788 1014	S2788	SO	URS	RADFORD SWMU 40/71	11/14/02
S2788-14	D-3	Q2788 ?1100	S2788	SO	URS	RADFORD SWMU 40/71	11/15/02
S2788-17	D-4	Q2788 ?	S2788	SO	URS	RADFORD SWMU 40/71	11/15/02

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-1

Sample wt/vol: 2.14(g/mL) G Lab File ID: S2788-1A62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 15 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	14	U
74-87-3	Chloromethane	14	U
75-01-4	Vinyl Chloride	14	U
74-83-9	Bromomethane	14	U
75-00-3	Chloroethane	14	U
75-69-4	Trichlorofluoromethane	14	U
75-35-4	1,1-Dichloroethene	14	U
75-15-0	Carbon disulfide	14	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	14	U
67-64-1	Acetone	11	J
75-09-2	Methylene Chloride	14	U
156-60-5	trans-1,2-Dichloroethene	14	U
1634-04-4	Methyl-tert-butyl ether	2	J
75-34-3	1,1-Dichloroethane	14	U
156-59-2	cis-1,2-Dichloroethene	14	U
78-93-3	2-butanone	34	U
67-66-3	Chloroform	14	U
71-55-6	1,1,1-Trichloroethane	14	U
56-23-5	Carbon Tetrachloride	14	U
71-43-2	Benzene	6	J
107-06-2	1,2-Dichloroethane	14	U
79-01-6	Trichloroethene	14	U
78-87-5	1,2-Dichloropropane	14	U
75-27-4	Bromodichloromethane	14	U
10061-01-5	cis-1,3-Dichloropropene	14	U
108-10-1	4-Methyl-2-pentanone	31	J
108-88-3	Toluene	8	JB
10061-02-6	trans-1,3-Dichloropropene	14	U
79-00-5	1,1,2-Trichloroethane	14	U
127-18-4	Tetrachloroethene	14	U
591-78-6	2-hexanone	34	U
124-48-1	Dibromochloromethane	14	U
106-93-4	1,2-Dibromoethane	14	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-1

Sample wt/vol: 2.14 (g/mL) G Lab File ID: S2788-1A62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 15 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	14	U
100-41-4	Ethylbenzene	17	
100-42-5	Styrene	14	U
75-25-2	Bromoform	14	U
98-82-8	Isopropyl Benzene	3	J
79-34-5	1,1,2,2-Tetrachloroethane	14	U
541-73-1	1,3-Dichlorobenzene	14	U
106-46-7	1,4-Dichlorobenzene	14	U
95-50-1	1,2-Dichlorobenzene	14	U
96-12-8	1,2-Dibromo-3-Chloropropane	14	U
120-82-1	1,2,4-Trichlorobenzene	14	U
1330-20-7	Xylene (total)	27	J
79-20-9	Methyl acetate	14	U
110-82-7	Cyclohexane	3	J
108-87-2	Methylcyclohexane	5	J

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-1

Sample wt/vol: 2.14 (g/mL) G Lab File ID: S2788-1A62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 15 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~4.40~~	~~32.80~~	~~JB~~
2.	95-36-3	1,2,4-TRIMETHYLBENZENE	4.77	39.29	NJ
3.		SUBSTITUTED BENZENE	5.02	45.43	J
4.		SUBSTITUTED BENZENE	5.04	28.39	J
5.	933-98-2	BENZENE, 1-ETHYL-2,3-DIMETHY	5.20	29.33	NJ
6.		~~LABORATORY ARTIFACT~~	~~5.22~~	~~45.27~~	~~JB~~
7.	767-58-8	INDAN, 1-METHYL-	5.25	57.36	NJ
8.	95-93-2	BENZENE, 1,2,4,5-TETRAMETHYL	5.39	62.44	NJ
9.	824-22-6	1H-INDENE, 2,3-DIHYDRO-4-MET	5.49	42.34	NJ
10.	2039-89-6	BENZENE, 2-ETHENYL-1,4-DIMET	5.56	80.29	NJ
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-3

Sample wt/vol: 2.68(g/mL) G Lab File ID: S2788-3A62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 29 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	13	U
74-87-3	Chloromethane	13	U
75-01-4	Vinyl Chloride	13	U
74-83-9	Bromomethane	13	U
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
75-15-0	Carbon disulfide	13	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	8	J
75-09-2	Methylene Chloride	2	J B,Z
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl-tert-butyl ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	33	U
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
71-43-2	Benzene	13	U
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	8	J
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	21	J
108-88-3	Toluene	6	JB
10061-02-6	trans-1,3-Dichloropropene	13	U
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	33	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-3

Sample wt/vol: 2.68(g/mL) G Lab File ID: S2788-3A62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 29 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	13	U
75-25-2	Bromoform	13	U
98-82-8	Isopropyl Benzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-Chloropropane	13	U
120-82-1	1,2,4-Trichlorobenzene	13	U
1330-20-7	Xylene (total)	11	J
79-20-9	Methyl acetate	13	U
110-82-7	Cyclohexane	13	U
108-87-2	Methylcyclohexane	13	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-3

Sample wt/vol: 2.68 (g/mL) G Lab File ID: S2788-3A62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 29 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-4

Sample wt/vol: 2.34(g/mL) G Lab File ID: S2788-4A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 32 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	16	U
74-87-3	Chloromethane	16	U
75-01-4	Vinyl Chloride	16	U
74-83-9	Bromomethane	16	U UJ,C
75-00-3	Chloroethane	16	U
75-69-4	Trichlorofluoromethane	16	U
75-35-4	1,1-Dichloroethene	16	U
75-15-0	Carbon disulfide	16	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	16	U
67-64-1	Acetone	200	
75-09-2	Methylene Chloride	4	J B,C
156-60-5	trans-1,2-Dichloroethene	16	U
1634-04-4	Methyl-tert-butyl ether	16	U
75-34-3	1,1-Dichloroethane	16	U
156-59-2	cis-1,2-Dichloroethene	16	U
78-93-3	2-butanone	39	U
67-66-3	Chloroform	16	U
71-55-6	1,1,1-Trichloroethane	16	U
56-23-5	Carbon Tetrachloride	16	U
71-43-2	Benzene	16	U
107-06-2	1,2-Dichloroethane	16	U
79-01-6	Trichloroethene	8	J
78-87-5	1,2-Dichloropropane	16	U
75-27-4	Bromodichloromethane	16	U
10061-01-5	cis-1,3-Dichloropropene	16	U
108-10-1	4-Methyl-2-pentanone	25	J
108-88-3	Toluene	13	JB
10061-02-6	trans-1,3-Dichloropropene	16	U
79-00-5	1,1,2-Trichloroethane	16	U
127-18-4	Tetrachloroethene	16	U
591-78-6	2-hexanone	39	U
124-48-1	Dibromochloromethane	16	U
106-93-4	1,2-Dibromoethane	16	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-4

Sample wt/vol: 2.34(g/mL) G Lab File ID: S2788-4A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 32 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	16	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	16	U
75-25-2	Bromoform	16	U
98-82-8	Isopropyl Benzene	16	U
79-34-5	1,1,2,2-Tetrachloroethane	16	U
541-73-1	1,3-Dichlorobenzene	16	U
106-46-7	1,4-Dichlorobenzene	16	U
95-50-1	1,2-Dichlorobenzene	16	U
96-12-8	1,2-Dibromo-3-Chloropropane	16	U
120-82-1	1,2,4-Trichlorobenzene	16	U
1330-20-7	Xylene (total)	29	J
79-20-9	Methyl acetate	16	U
110-82-7	Cyclohexane	16	U
108-87-2	Methylcyclohexane	16	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-4

Sample wt/vol: 2.34 (g/mL) G Lab File ID: S2788-4A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 32 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~3.28~~	~~21.05~~	~~J~~
2.		~~LABORATORY ARTIFACT~~	~~5.23~~	~~17.82~~	~~J~~
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-2

Sample wt/vol: 2.02(g/mL) G Lab File ID: S2788-2A62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	15	U
74-87-3	Chloromethane	15	U
75-01-4	Vinyl Chloride	15	U
74-83-9	Bromomethane	15	U
75-00-3	Chloroethane	15	U
75-69-4	Trichlorofluoromethane	15	U
75-35-4	1,1-Dichloroethene	15	U
75-15-0	Carbon disulfide	3	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	15	U
67-64-1	Acetone	99	
75-09-2	Methylene Chloride	3	J B,Z
156-60-5	trans-1,2-Dichloroethene	15	U
1634-04-4	Methyl-tert-butyl ether	15	U
75-34-3	1,1-Dichloroethane	15	U
156-59-2	cis-1,2-Dichloroethene	15	U
78-93-3	2-butanone	38	U
67-66-3	Chloroform	15	U
71-55-6	1,1,1-Trichloroethane	15	U
56-23-5	Carbon Tetrachloride	15	U
71-43-2	Benzene	15	U
107-06-2	1,2-Dichloroethane	15	U
79-01-6	Trichloroethene	12	J
78-87-5	1,2-Dichloropropane	15	U
75-27-4	Bromodichloromethane	15	U
10061-01-5	cis-1,3-Dichloropropene	15	U
108-10-1	4-Methyl-2-pentanone	38	U
108-88-3	Toluene	9	JB
10061-02-6	trans-1,3-Dichloropropene	15	U
79-00-5	1,1,2-Trichloroethane	15	U
127-18-4	Tetrachloroethene	15	U
591-78-6	2-hexanone	38	U
124-48-1	Dibromochloromethane	15	U
106-93-4	1,2-Dibromoethane	15	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-2

Sample wt/vol: 2.02(g/mL) G Lab File ID: S2788-2A62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	15	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	15	U
75-25-2	Bromoform	15	U
98-82-8	Isopropyl Benzene	15	U
79-34-5	1,1,2,2-Tetrachloroethane	15	U
541-73-1	1,3-Dichlorobenzene	15	U
106-46-7	1,4-Dichlorobenzene	15	U
95-50-1	1,2-Dichlorobenzene	15	U
96-12-8	1,2-Dibromo-3-Chloropropane	15	U
120-82-1	1,2,4-Trichlorobenzene	15	U
1330-20-7	Xylene (total)	16	J
79-20-9	Methyl acetate	15	U
110-82-7	Cyclohexane	15	U
108-87-2	Methylcyclohexane	15	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-2

Sample wt/vol: 2.02 (g/mL) G Lab File ID: S2788-2A62

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	541-05-9	CYCLOTRISILOXANE, HEXAMETHYL	3.28	28.23 RA 3,11,03	NJ
2.					
3.					
4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 4.02(g/mL) G Lab File ID: S2788-18A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 22 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	U
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	3	JB
67-64-1	Acetone	990	E
75-09-2	Methylene Chloride	15	B
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	77	
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	8	U
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	11	
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	20	U
108-88-3	Toluene	4	JB
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	20	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

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FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 4.02(g/mL) G Lab File ID: S2788-18A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 22 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	8	U
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	2	J
79-20-9	Methyl acetate	8	U
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 4.02 (g/mL) G Lab File ID: S2788-18A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 22 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	75-07-0	ACETALDEHYDE	4.28	11.17	NJ
2.		~~UNKNOWN~~	~~10.49~~	~~8.58~~	~~J~~
3.	110-62-3	PENTANAL	11.46	18.89	NJ
4.	66-25-1	HEXANAL	13.34	51.82	NJ
5.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3ARE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 4.93(g/mL) G Lab File ID: S2788-18RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 22 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	2	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	220	
75-09-2	Methylene Chloride	1	J
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	11	J
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	7	U
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	4	J
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	16	U
108-88-3	Toluene	1	JB
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	16	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3ARE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 4.93(g/mL) G Lab File ID: S2788-18RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 22 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	7	U
100-42-5	Styrene	7	U
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	7	U
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	1	J
79-20-9	Methyl acetate	7	U
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB3ARE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 4.93 (g/mL) G Lab File ID: S2788-18RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 22 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 2.78(g/mL) G Lab File ID: S2788-19A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 37 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	14	U UJ,i
74-87-3	Chloromethane	14	U
75-01-4	Vinyl Chloride	14	U
74-83-9	Bromomethane	14	U
75-00-3	Chloroethane	14	U
75-69-4	Trichlorofluoromethane	6	J J,i
75-35-4	1,1-Dichloroethene	14	U UJ,i
75-15-0	Carbon disulfide	14	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	11	JB J,i
67-64-1	Acetone	250	
75-09-2	Methylene Chloride	12	J B i,z
156-60-5	trans-1,2-Dichloroethene	14	U UJ,i
1634-04-4	Methyl-tert-butyl ether	14	U
75-34-3	1,1-Dichloroethane	14	U
156-59-2	cis-1,2-Dichloroethene	14	U
78-93-3	2-butanone	36	U
67-66-3	Chloroform	14	U
71-55-6	1,1,1-Trichloroethane	14	U
56-23-5	Carbon Tetrachloride	14	U
71-43-2	Benzene	14	U
107-06-2	1,2-Dichloroethane	14	U
79-01-6	Trichloroethene	21	J,i
78-87-5	1,2-Dichloropropane	14	U UJ,i
75-27-4	Bromodichloromethane	14	U
10061-01-5	cis-1,3-Dichloropropene	14	U
108-10-1	4-Methyl-2-pentanone	12	J K,S
108-88-3	Toluene	12	JB K,S
10061-02-6	trans-1,3-Dichloropropene	14	U
79-00-5	1,1,2-Trichloroethane	14	U
127-18-4	Tetrachloroethene	14	U
591-78-6	2-hexanone	36	U
124-48-1	Dibromochloromethane	14	U
106-93-4	1,2-Dibromoethane	14	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 2.78(g/mL) G Lab File ID: S2788-19A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 37 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	14	U
100-41-4	Ethylbenzene	14	U
100-42-5	Styrene	4	J KJS
75-25-2	Bromoform	14	U
98-82-8	Isopropyl Benzene	14	U
79-34-5	1,1,2,2-Tetrachloroethane	14	U
541-73-1	1,3-Dichlorobenzene	14	U
106-46-7	1,4-Dichlorobenzene	14	U
95-50-1	1,2-Dichlorobenzene	14	U
96-12-8	1,2-Dibromo-3-Chloropropane	14	U
120-82-1	1,2,4-Trichlorobenzene	14	U
1330-20-7	Xylene (total)	10	J KJS
79-20-9	Methyl acetate	18	J JC
110-82-7	Cyclohexane	14	U
108-87-2	Methylcyclohexane	14	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 2.78 (g/mL) G Lab File ID: S2788-19A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 37 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3BRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 3.51(g/mL) G Lab File ID: S2788-19RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 37 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	11	U UL,h
74-87-3	Chloromethane	11	U
75-01-4	Vinyl Chloride	11	U
74-83-9	Bromomethane	11	U
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-15-0	Carbon disulfide	11	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	11	U
67-64-1	Acetone	360	L,h
75-09-2	Methylene Chloride	3	J
156-60-5	trans-1,2-Dichloroethene	11	U UL,h
1634-04-4	Methyl-tert-butyl ether	11	U
75-34-3	1,1-Dichloroethane	11	U
156-59-2	cis-1,2-Dichloroethene	11	U
78-93-3	2-butanone	28	U
67-66-3	Chloroform	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
71-43-2	Benzene	11	U
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	10	J L,h
78-87-5	1,2-Dichloropropane	11	U UL,h
75-27-4	Bromodichloromethane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-10-1	4-Methyl-2-pentanone	28	U
108-88-3	Toluene	3	JB B,z
10061-02-6	trans-1,3-Dichloropropene	11	U UL,h
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
591-78-6	2-hexanone	28	U
124-48-1	Dibromochloromethane	11	U
106-93-4	1,2-Dibromoethane	11	U

Do not use RA

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3BRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 3.51(g/mL) G Lab File ID: S2788-19RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 37 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
75-25-2	Bromoform	11	U
98-82-8	Isopropyl Benzene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	11	U
95-50-1	1,2-Dichlorobenzene	11	U
96-12-8	1,2-Dibromo-3-Chloropropane	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
1330-20-7	Xylene (total)	3	J
79-20-9	Methyl acetate	18	
110-82-7	Cyclohexane	11	U
108-87-2	Methylcyclohexane	11	U

Do not FAX

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB3BRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 3.51 (g/mL) G Lab File ID: S2788-19RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 37 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 4.24(g/mL) G Lab File ID: S2788-20A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	9	U UJ,i
74-87-3	Chloromethane	9	U
75-01-4	Vinyl Chloride	9	U
74-83-9	Bromomethane	9	U
75-00-3	Chloroethane	9	U
75-69-4	Trichlorofluoromethane	9	U
75-35-4	1,1-Dichloroethene	9	U
75-15-0	Carbon disulfide	9	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	JB B,Z
67-64-1	Acetone	140	J,i
75-09-2	Methylene Chloride	15	B,Z
156-60-5	trans-1,2-Dichloroethene	9	U UJ,i
1634-04-4	Methyl-tert-butyl ether	9	U
75-34-3	1,1-Dichloroethane	9	U
156-59-2	cis-1,2-Dichloroethene	9	U
78-93-3	2-butanone	21	U
67-66-3	Chloroform	9	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
71-43-2	Benzene	9	U
107-06-2	1,2-Dichloroethane	9	U
79-01-6	Trichloroethene	14	J,i
78-87-5	1,2-Dichloropropane	9	U UJ,i
75-27-4	Bromodichloromethane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
108-10-1	4-Methyl-2-pentanone	21	U
108-88-3	Toluene	4	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	9	U
79-00-5	1,1,2-Trichloroethane	9	U
127-18-4	Tetrachloroethene	9	U
591-78-6	2-hexanone	21	U
124-48-1	Dibromochloromethane	9	U
106-93-4	1,2-Dibromoethane	9	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 4.24(g/mL) G Lab File ID: S2788-20A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	9	U
100-41-4	Ethylbenzene	9	U
100-42-5	Styrene	9	U
75-25-2	Bromoform	9	U
98-82-8	Isopropyl Benzene	9	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U
541-73-1	1,3-Dichlorobenzene	9	U
106-46-7	1,4-Dichlorobenzene	9	U
95-50-1	1,2-Dichlorobenzene	9	U
96-12-8	1,2-Dibromo-3-Chloropropane	9	U
120-82-1	1,2,4-Trichlorobenzene	9	U
1330-20-7	Xylene (total)	3	JKS
79-20-9	Methyl acetate	9	UJC
110-82-7	Cyclohexane	9	U
108-87-2	Methylcyclohexane	9	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 4.24 (g/mL) G Lab File ID: S2788-20A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 4.80(g/mL) G Lab File ID: S2788-20RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
75-71-8	Dichlorodifluoromethane		8	U UL,h
74-87-3	Chloromethane		8	U
75-01-4	Vinyl Chloride		8	U
74-83-9	Bromomethane		8	U
75-00-3	Chloroethane		8	U
75-69-4	Trichlorofluoromethane		8	U
75-35-4	1,1-Dichloroethene		8	U
75-15-0	Carbon disulfide		8	U
76-13-1	1,1,2-trichloro-1,2,2-triflu		8	U
67-64-1	Acetone		69	L,h
75-09-2	Methylene Chloride		1	J
156-60-5	trans-1,2-Dichloroethene		8	U UL,h
1634-04-4	Methyl-tert-butyl ether		8	U
75-34-3	1,1-Dichloroethane		8	U
156-59-2	cis-1,2-Dichloroethene		8	U
78-93-3	2-butanone		19	U
67-66-3	Chloroform		8	U
71-55-6	1,1,1-Trichloroethane		8	U
56-23-5	Carbon Tetrachloride		8	U
71-43-2	Benzene		8	U
107-06-2	1,2-Dichloroethane		8	U
79-01-6	Trichloroethene		5	J L,h
78-87-5	1,2-Dichloropropane		8	U UL,h
75-27-4	Bromodichloromethane		8	U
10061-01-5	cis-1,3-Dichloropropene		8	U
108-10-1	4-Methyl-2-pentanone		19	U
108-88-3	Toluene		2	JB B,z
10061-02-6	trans-1,3-Dichloropropene		8	U UL,h
79-00-5	1,1,2-Trichloroethane		8	U
127-18-4	Tetrachloroethene		8	U
591-78-6	2-hexanone		19	U
124-48-1	Dibromochloromethane		8	U
106-93-4	1,2-Dibromoethane		8	U

Do Not RA

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 4.80(g/mL) G Lab File ID: S2788-20RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	8	U
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	2	J
79-20-9	Methyl acetate	8	U
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

Do Not use RT

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB3CRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 4.80 (g/mL) G Lab File ID: S2788-20RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~556-67-2~~	CYCLOTETRASILOXANE, OCTAMETH	13.53	15.57	NJ
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RA 2/14/03

FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 4.85(g/mL) G Lab File ID: S2788-15A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 26 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U UJ,i
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	7	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	3	JB B,i,z
67-64-1	Acetone	280	J,i
75-09-2	Methylene Chloride	10	B,i,z
156-60-5	trans-1,2-Dichloroethene	7	U UJ,i
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	17	U
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	7	U
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	10	J,i
78-87-5	1,2-Dichloropropane	7	U UJ,i
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	5	J K,i,s
108-88-3	Toluene	4	JB B,i,z
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	17	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 4.85(g/mL) G Lab File ID: S2788-15A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 26 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	3	J K,S
100-41-4	Ethylbenzene	7	U
100-42-5	Styrene	2	J K,S
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	7	U
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	4	J K,S
79-20-9	Methyl acetate	7	U W,C
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 4.85 (g/mL) G Lab File ID: S2788-15A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 26 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4BRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 4.93(g/mL) G Lab File ID: S2788-15RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 26 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	0.8	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	110	
75-09-2	Methylene Chloride	1	J
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	17	U
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	7	U
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	5	J
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	17	U
108-88-3	Toluene	2	J
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	17	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

Do Not use RA

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4BRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 4.93(g/mL) G Lab File ID: S2788-15RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 26 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
108-90-7	Chlorobenzene		7	U
100-41-4	Ethylbenzene		7	U
100-42-5	Styrene		0.4	J
75-25-2	Bromoform		7	U
98-82-8	Isopropyl Benzene		7	U
79-34-5	1,1,2,2-Tetrachloroethane		7	U
541-73-1	1,3-Dichlorobenzene		7	U
106-46-7	1,4-Dichlorobenzene		7	U
95-50-1	1,2-Dichlorobenzene		7	U
96-12-8	1,2-Dibromo-3-Chloropropane		7	U
120-82-1	1,2,4-Trichlorobenzene		7	U
1330-20-7	Xylene (total)		2	J
79-20-9	Methyl acetate		7	U
110-82-7	Cyclohexane		7	U
108-87-2	Methylcyclohexane		7	U

DO NOT USE RA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4BRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 4.93 (g/mL) G Lab File ID: S2788-15RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 26 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 3.00(g/mL) G Lab File ID: S2788-16A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	12	U UJ,i
74-87-3	Chloromethane	12	U
75-01-4	Vinyl Chloride	12	U
74-83-9	Bromomethane	12	U
75-00-3	Chloroethane	12	U
75-69-4	Trichlorofluoromethane	12	U
75-35-4	1,1-Dichloroethene	12	U
75-15-0	Carbon disulfide	12	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	JB B,Z
67-64-1	Acetone	280	J,i
75-09-2	Methylene Chloride	20	B,Z
156-60-5	trans-1,2-Dichloroethene	12	U UJ,i
1634-04-4	Methyl-tert-butyl ether	12	U
75-34-3	1,1-Dichloroethane	12	U
156-59-2	cis-1,2-Dichloroethene	12	U
78-93-3	2-butanone	56	J,i
67-66-3	Chloroform	12	U UJ,i
71-55-6	1,1,1-Trichloroethane	12	U
56-23-5	Carbon Tetrachloride	12	U
71-43-2	Benzene	12	U
107-06-2	1,2-Dichloroethane	12	U
79-01-6	Trichloroethene	19	J,i
78-87-5	1,2-Dichloropropane	12	U UJ,i
75-27-4	Bromodichloromethane	12	U
10061-01-5	cis-1,3-Dichloropropene	12	U
108-10-1	4-Methyl-2-pentanone	11	J K,S
108-88-3	Toluene	6	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	12	U
79-00-5	1,1,2-Trichloroethane	12	U
127-18-4	Tetrachloroethene	12	U
591-78-6	2-hexanone	31	U
124-48-1	Dibromochloromethane	12	U
106-93-4	1,2-Dibromoethane	12	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 3.00(g/mL) G Lab File ID: S2788-16A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	12	U
100-41-4	Ethylbenzene	12	U
100-42-5	Styrene	12	U
75-25-2	Bromoform	12	U
98-82-8	Isopropyl Benzene	12	U
79-34-5	1,1,2,2-Tetrachloroethane	12	U
541-73-1	1,3-Dichlorobenzene	12	U
106-46-7	1,4-Dichlorobenzene	12	U
95-50-1	1,2-Dichlorobenzene	12	U
96-12-8	1,2-Dibromo-3-Chloropropane	12	U
120-82-1	1,2,4-Trichlorobenzene	12	U
1330-20-7	Xylene (total)	5	J K S
79-20-9	Methyl acetate	12	U U J C
110-82-7	Cyclohexane	12	U
108-87-2	Methylcyclohexane	12	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 3.00 (g/mL) G Lab File ID: S2788-16A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 3.51(g/mL) G Lab File ID: S2788-16RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	11	U
74-87-3	Chloromethane	11	U
75-01-4	Vinyl Chloride	11	U
74-83-9	Bromomethane	11	U
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-15-0	Carbon disulfide	2	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	11	U
67-64-1	Acetone	140	
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	11	U
1634-04-4	Methyl-tert-butyl ether	11	U
75-34-3	1,1-Dichloroethane	11	U
156-59-2	cis-1,2-Dichloroethene	11	U
78-93-3	2-butanone	27	U
67-66-3	Chloroform	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
71-43-2	Benzene	11	U
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	7	J
78-87-5	1,2-Dichloropropane	11	U
75-27-4	Bromodichloromethane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-10-1	4-Methyl-2-pentanone	27	U
108-88-3	Toluene	3	JB
10061-02-6	trans-1,3-Dichloropropene	11	U
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
591-78-6	2-hexanone	27	U
124-48-1	Dibromochloromethane	11	U
106-93-4	1,2-Dibromoethane	11	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 3.51(g/mL) G Lab File ID: S2788-16RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
75-25-2	Bromoform	11	U
98-82-8	Isopropyl Benzene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	11	U
95-50-1	1,2-Dichlorobenzene	11	U
96-12-8	1,2-Dibromo-3-Chloropropane	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
1330-20-7	Xylene (total)	3	J
79-20-9	Methyl acetate	11	U
110-82-7	Cyclohexane	11	U
108-87-2	Methylcyclohexane	11	U

Do Not Use RA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4CRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 3.51 (g/mL) G Lab File ID: S2788-16RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~13.53~~	~~14.26~~	~~J~~
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 5.19(g/mL) G Lab File ID: S2788-11A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	3	J
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	U
75-15-0	Carbon disulfide	6	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	6	U
67-64-1	Acetone	420	
75-09-2	Methylene Chloride	0.8	J B,R
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl-tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-butanone	56	
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
71-43-2	Benzene	11	
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	6	U
78-87-5	1,2-Dichloropropane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	15	U
108-88-3	Toluene	7	B
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-hexanone	35	
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U

DO NOT USE

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 5.19(g/mL) G Lab File ID: S2788-11A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropyl Benzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-Chloropropane	6	U
120-82-1	1,2,4-Trichlorobenzene	6	U
1330-20-7	Xylene (total)	5	J
79-20-9	Methyl acetate	110	
110-82-7	Cyclohexane	6	U
108-87-2	Methylcyclohexane	6	U

Q → RI DO NOT USE

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 5.19 (g/mL) G Lab File ID: S2788-11A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	0.96	50.75	J
2.		~~LABORATORY ARTIFACT~~	5.23	6.13	J
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
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27.					
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29.					
30.					

RA 12/4/02

FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6ARE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 3.62(g/mL) G Lab File ID: S2788-11RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U UL,h
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	U
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	8	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	8	U
67-64-1	Acetone	190	L,h
75-09-2	Methylene Chloride	8	U UL,h
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	21	U
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	3	JL,h
107-06-2	1,2-Dichloroethane	8	UUL,h
79-01-6	Trichloroethene	3	JL,h
78-87-5	1,2-Dichloropropane	8	UUL,h
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	21	U
108-88-3	Toluene	3	JB B,h
10061-02-6	trans-1,3-Dichloropropene	8	UUL,h
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	21	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6ARE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 3.62(g/mL) G Lab File ID: S2788-11RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U U L,h
100-41-4	Ethylbenzene	8	U
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	5	J L,h
79-20-9	Methyl acetate	8	U U L,h
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB6ARE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 3.62 (g/mL) G Lab File ID: S2788-11RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 18 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
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29.					
30.					

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 3.64(g/mL) G Lab File ID: S2788-13A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 26 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	9	U
74-87-3	Chloromethane	9	U
75-01-4	Vinyl Chloride	9	U
74-83-9	Bromomethane	9	UUJ,C
75-00-3	Chloroethane	9	U
75-69-4	Trichlorofluoromethane	9	U
75-35-4	1,1-Dichloroethene	9	U
75-15-0	Carbon disulfide	9	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	9	U
67-64-1	Acetone	74	
75-09-2	Methylene Chloride	2	J B,T
156-60-5	trans-1,2-Dichloroethene	9	U
1634-04-4	Methyl-tert-butyl ether	9	U
75-34-3	1,1-Dichloroethane	9	U
156-59-2	cis-1,2-Dichloroethene	9	U
78-93-3	2-butanone	10	J
67-66-3	Chloroform	9	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
71-43-2	Benzene	9	U
107-06-2	1,2-Dichloroethane	9	U
79-01-6	Trichloroethene	4	J
78-87-5	1,2-Dichloropropane	9	U
75-27-4	Bromodichloromethane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
108-10-1	4-Methyl-2-pentanone	23	U
108-88-3	Toluene	7	JB
10061-02-6	trans-1,3-Dichloropropene	9	U
79-00-5	1,1,2-Trichloroethane	9	U
127-18-4	Tetrachloroethene	9	U
591-78-6	2-hexanone	23	U
124-48-1	Dibromochloromethane	9	U
106-93-4	1,2-Dibromoethane	9	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 3.64(g/mL) G Lab File ID: S2788-13A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 26 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	9	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	9	U
75-25-2	Bromoform	9	U
98-82-8	Isopropyl Benzene	9	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U UJ
541-73-1	1,3-Dichlorobenzene	9	U
106-46-7	1,4-Dichlorobenzene	9	U
95-50-1	1,2-Dichlorobenzene	9	U
96-12-8	1,2-Dibromo-3-Chloropropane	9	U
120-82-1	1,2,4-Trichlorobenzene	9	U
1330-20-7	Xylene (total)	13	J
79-20-9	Methyl acetate	9	U
110-82-7	Cyclohexane	9	U
108-87-2	Methylcyclohexane	9	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 3.64 (g/mL) G Lab File ID: S2788-13A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 26 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	3.28	10.81	J
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
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30.					

FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 3.62(g/mL) G Lab File ID: S2788-13RB59

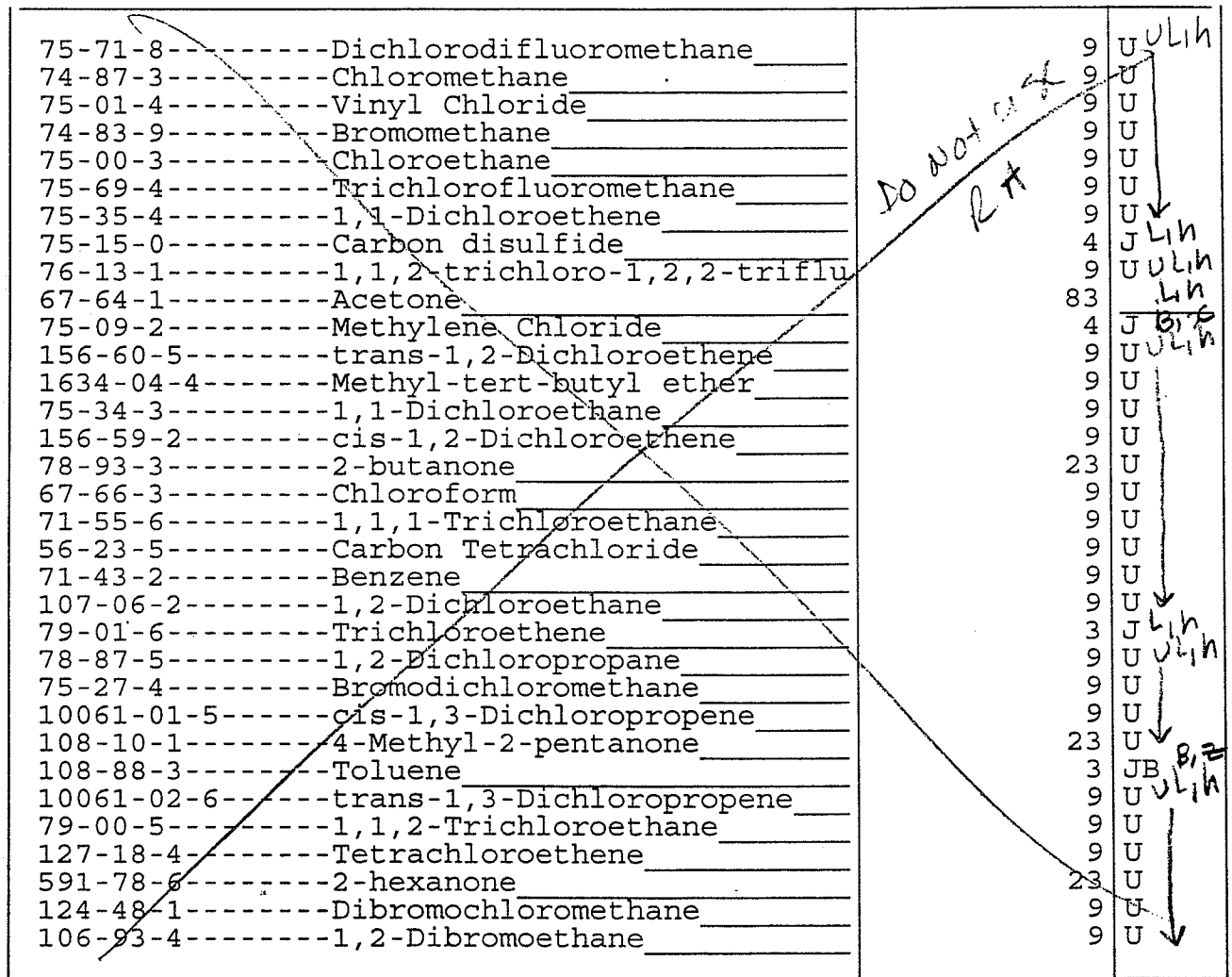
Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 26 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	9	U
74-87-3	Chloromethane	9	U
75-01-4	Vinyl Chloride	9	U
74-83-9	Bromomethane	9	U
75-00-3	Chloroethane	9	U
75-69-4	Trichlorofluoromethane	9	U
75-35-4	1,1-Dichloroethene	9	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	9	U
67-64-1	Acetone	83	
75-09-2	Methylene Chloride	4	J
156-60-5	trans-1,2-Dichloroethene	9	U
1634-04-4	Methyl-tert-butyl ether	9	U
75-34-3	1,1-Dichloroethane	9	U
156-59-2	cis-1,2-Dichloroethene	9	U
78-93-3	2-butanone	23	U
67-66-3	Chloroform	9	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
71-43-2	Benzene	9	U
107-06-2	1,2-Dichloroethane	9	U
79-01-6	Trichloroethene	3	J
78-87-5	1,2-Dichloropropane	9	U
75-27-4	Bromodichloromethane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
108-10-1	4-Methyl-2-pentanone	23	U
108-88-3	Toluene	3	JB
10061-02-6	trans-1,3-Dichloropropene	9	U
79-00-5	1,1,2-Trichloroethane	9	U
127-18-4	Tetrachloroethene	9	U
591-78-6	2-hexanone	23	U
124-48-1	Dibromochloromethane	9	U
106-93-4	1,2-Dibromoethane	9	U



FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 3.62(g/mL) G Lab File ID: S2788-13RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 26 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	9	U
100-41-4	Ethylbenzene	9	U
100-42-5	Styrene	9	U
75-25-2	Bromoform	9	U
98-82-8	Isopropyl Benzene	9	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U
541-73-1	1,3-Dichlorobenzene	9	U
106-46-7	1,4-Dichlorobenzene	9	U
95-50-1	1,2-Dichlorobenzene	9	U
96-12-8	1,2-Dibromo-3-Chloropropane	9	U
120-82-1	1,2,4-Trichlorobenzene	9	U
1330-20-7	Xylene (total)	4	J
79-20-9	Methyl acetate	9	U
110-82-7	Cyclohexane	9	U
108-87-2	Methylcyclohexane	9	U

Do Not Use RA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB6CRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 3.62 (g/mL) G Lab File ID: S2788-13RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 26 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
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27.					
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29.					
30.					

FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 4.89(g/mL) G Lab File ID: S2788-12A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	6	U
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	U
75-15-0	Carbon disulfide	14	
76-13-1	1,1,2-trichloro-1,2,2-triflu	6	U
67-64-1	Acetone	110	
75-09-2	Methylene Chloride	3	JB
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl-tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-butanone	16	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
71-43-2	Benzene	2	J
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	4	J
78-87-5	1,2-Dichloropropane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	16	U
108-88-3	Toluene	4	JB
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-hexanone	16	U
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U

Do not use RT

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 4.89(g/mL) G Lab File ID: S2788-12A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	0.8	J
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropyl Benzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-Chloropropane	6	U
120-82-1	1,2,4-Trichlorobenzene	6	U
1330-20-7	Xylene (total)	4	J
79-20-9	Methyl acetate	39	
110-82-7	Cyclohexane	6	U
108-87-2	Methylcyclohexane	6	U

DO NOT U4

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 4.89 (g/mL) G Lab File ID: S2788-12A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	4.40	11.89	~~J~~
2.		~~LABORATORY ARTIFACT~~	5.23	~~17.60~~	~~J~~
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 2.89(g/mL) G Lab File ID: S2788-12RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	11	U
74-87-3	Chloromethane	11	U
75-01-4	Vinyl Chloride	11	U
74-83-9	Bromomethane	11	U
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	11	U
67-64-1	Acetone	95	
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	11	U
1634-04-4	Methyl-tert-butyl ether	11	U
75-34-3	1,1-Dichloroethane	11	U
156-59-2	cis-1,2-Dichloroethene	11	U
78-93-3	2-butanone	27	U
67-66-3	Chloroform	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
71-43-2	Benzene	1	J
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	4	J
78-87-5	1,2-Dichloropropane	11	U
75-27-4	Bromodichloromethane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-10-1	4-Methyl-2-pentanone	27	U
108-88-3	Toluene	4	JB
10061-02-6	trans-1,3-Dichloropropene	11	U
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
591-78-6	2-hexanone	27	U
124-48-1	Dibromochloromethane	11	U
106-93-4	1,2-Dibromoethane	11	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 2.89(g/mL) G Lab File ID: S2788-12RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	11	U UL,h
100-41-4	Ethylbenzene	0.8	J L,h
100-42-5	Styrene	11	U UL,h
75-25-2	Bromoform	11	U
98-82-8	Isopropyl Benzene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	11	U
95-50-1	1,2-Dichlorobenzene	11	U
96-12-8	1,2-Dibromo-3-Chloropropane	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
1330-20-7	Xylene (total)	5	J L,h
79-20-9	Methyl acetate	11	U UL,h
110-82-7	Cyclohexane	11	U
108-87-2	Methylcyclohexane	11	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB6FRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 2.89 (g/mL) G Lab File ID: S2788-12RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 20 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 5.22(g/mL) G Lab File ID: S2788-6RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 15 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	6	U UJ,C
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	U
75-15-0	Carbon disulfide	2	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	6	U
67-64-1	Acetone	37	B,Z
75-09-2	Methylene Chloride	0.7	J B,Z
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl-tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-butanone	14	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
71-43-2	Benzene	6	U
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	2	J
78-87-5	1,2-Dichloropropane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	8	J
108-88-3	Toluene	3	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-hexanone	14	U
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 5.22(g/mL) G Lab File ID: S2788-6RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 15 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropyl Benzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-Chloropropane	6	U
120-82-1	1,2,4-Trichlorobenzene	6	U
1330-20-7	Xylene (total)	6	J
79-20-9	Methyl acetate	6	U
110-82-7	Cyclohexane	6	U
108-87-2	Methylcyclohexane	6	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 5.22 (g/mL) G Lab File ID: S2788-6RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 15 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-8

Sample wt/vol: 3.60(g/mL) G Lab File ID: S2788-8RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 31 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U VJ c
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	10	U
67-64-1	Acetone	23	J
75-09-2	Methylene Chloride	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl-tert-butyl ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-butanone	25	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	6	J
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	12	J
108-88-3	Toluene	7	JB
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-hexanone	25	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-8

Sample wt/vol: 3.60(g/mL) G Lab File ID: S2788-8RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 31 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropyl Benzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
1330-20-7	Xylene (total)	11	J
79-20-9	Methyl acetate	10	U
110-82-7	Cyclohexane	10	U
108-87-2	Methylcyclohexane	10	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-8

Sample wt/vol: 3.60 (g/mL) G Lab File ID: S2788-8RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 31 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		LABORATORY ARTIFACT	3.28	13.96	J
2.		LABORATORY ARTIFACT	4.40	11.01	J
3.		LABORATORY ARTIFACT	5.23	10.97	J
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-9

Sample wt/vol: 3.01(g/mL) G Lab File ID: S2788-9A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 30 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	12	U
74-87-3	Chloromethane	12	U
75-01-4	Vinyl Chloride	12	U
74-83-9	Bromomethane	12	U
75-00-3	Chloroethane	12	U
75-69-4	Trichlorofluoromethane	12	U
75-35-4	1,1-Dichloroethene	12	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	12	U
67-64-1	Acetone	300	
75-09-2	Methylene Chloride	12	U
156-60-5	trans-1,2-Dichloroethene	12	U
1634-04-4	Methyl-tert-butyl ether	12	U
75-34-3	1,1-Dichloroethane	12	U
156-59-2	cis-1,2-Dichloroethene	12	U
78-93-3	2-butanone	37	
67-66-3	Chloroform	12	U
71-55-6	1,1,1-Trichloroethane	12	U
56-23-5	Carbon Tetrachloride	12	U
71-43-2	Benzene	12	U
107-06-2	1,2-Dichloroethane	12	U
79-01-6	Trichloroethene	9	J
78-87-5	1,2-Dichloropropane	12	U
75-27-4	Bromodichloromethane	12	U
10061-01-5	cis-1,3-Dichloropropene	12	U
108-10-1	4-Methyl-2-pentanone	16	J
108-88-3	Toluene	6	JB
10061-02-6	trans-1,3-Dichloropropene	12	U
79-00-5	1,1,2-Trichloroethane	12	U
127-18-4	Tetrachloroethene	12	U
591-78-6	2-hexanone	30	U
124-48-1	Dibromochloromethane	12	U
106-93-4	1,2-Dibromoethane	12	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-9

Sample wt/vol: 3.01(g/mL) G Lab File ID: S2788-9A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 30 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	12	U
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	12	U
75-25-2	Bromoform	12	U
98-82-8	Isopropyl Benzene	12	U
79-34-5	1,1,2,2-Tetrachloroethane	12	U
541-73-1	1,3-Dichlorobenzene	12	U
106-46-7	1,4-Dichlorobenzene	12	U
95-50-1	1,2-Dichlorobenzene	12	U
96-12-8	1,2-Dibromo-3-Chloropropane	12	U
120-82-1	1,2,4-Trichlorobenzene	12	U
1330-20-7	Xylene (total)	15	J
79-20-9	Methyl acetate	12	U
110-82-7	Cyclohexane	12	U
108-87-2	Methylcyclohexane	12	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-9

Sample wt/vol: 3.01 (g/mL) G Lab File ID: S2788-9A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 30 Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	7446-09-5	SULFUR DIOXIDE	0.84	1169	NJ NJ t
2.		~~LABORATORY ARTIFACT~~	5.23	~~13.41~~	~~JB~~
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 2.59(g/mL) G Lab File ID: S2788-7A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 30 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	14	U UJ
74-87-3	Chloromethane	14	U
75-01-4	Vinyl Chloride	14	U
74-83-9	Bromomethane	14	U
75-00-3	Chloroethane	14	U
75-69-4	Trichlorofluoromethane	4	J J
75-35-4	1,1-Dichloroethene	14	U UJ
75-15-0	Carbon disulfide	58	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	14	U UJ
67-64-1	Acetone	410	J
75-09-2	Methylene Chloride	3	J B,Z
156-60-5	trans-1,2-Dichloroethene	14	U UJ
1634-04-4	Methyl-tert-butyl ether	14	U
75-34-3	1,1-Dichloroethane	14	U
156-59-2	cis-1,2-Dichloroethene	14	U
78-93-3	2-butanone	87	J
67-66-3	Chloroform	14	U UJ
71-55-6	1,1,1-Trichloroethane	14	U
56-23-5	Carbon Tetrachloride	14	U
71-43-2	Benzene	1	J J
107-06-2	1,2-Dichloroethane	14	U UJ
79-01-6	Trichloroethene	8	J J
78-87-5	1,2-Dichloropropane	14	U UJ
75-27-4	Bromodichloromethane	14	U
10061-01-5	cis-1,3-Dichloropropene	14	U
108-10-1	4-Methyl-2-pentanone	53	J
108-88-3	Toluene	9	JB
10061-02-6	trans-1,3-Dichloropropene	14	U UJ
79-00-5	1,1,2-Trichloroethane	14	U
127-18-4	Tetrachloroethene	14	U
591-78-6	2-hexanone	34	U
124-48-1	Dibromochloromethane	14	U
106-93-4	1,2-Dibromoethane	14	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 2.59(g/mL) G Lab File ID: S2788-7A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 30 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	14	U UJ
100-41-4	Ethylbenzene	14	U
100-42-5	Styrene	14	U
75-25-2	Bromoform	14	U
98-82-8	Isopropyl Benzene	14	U
79-34-5	1,1,2,2-Tetrachloroethane	14	U R
541-73-1	1,3-Dichlorobenzene	14	U
106-46-7	1,4-Dichlorobenzene	14	U
95-50-1	1,2-Dichlorobenzene	14	U
96-12-8	1,2-Dibromo-3-Chloropropane	14	U
120-82-1	1,2,4-Trichlorobenzene	14	U
1330-20-7	Xylene (total)	8	J
79-20-9	Methyl acetate	14	U UJ
110-82-7	Cyclohexane	14	U
108-87-2	Methylcyclohexane	14	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 2.59 (g/mL) G Lab File ID: S2788-7A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 30 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 4.87(g/mL) G Lab File ID: S2788-7RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 30 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	140	
75-09-2	Methylene Chloride	5	JB,X
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	23	
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	0.7	J
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	5	J
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	18	U
108-88-3	Toluene	8	B
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	18	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

DO NOT USE RA 11/4/03

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 4.87(g/mL) G Lab File ID: S2788-7RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 30 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	7	U
100-42-5	Styrene	7	U
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	7	U
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	9	J
79-20-9	Methyl acetate	49	
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB7FRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 4.87 (g/mL) G Lab File ID: S2788-7RA61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 30 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	5.22	10.94	J
2.					
3.				RA	
4.					
5.				211410	
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-5

Sample wt/vol: 2.55(g/mL) G Lab File ID: S2788-5A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 23 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	13	U
74-87-3	Chloromethane	13	U
75-01-4	Vinyl Chloride	13	U
74-83-9	Bromomethane	13	U UJ, C
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	31	J
75-09-2	Methylene Chloride	3	J B, X
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl-tert-butyl ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	32	U
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
71-43-2	Benzene	13	U
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	5	J
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	32	U
108-88-3	Toluene	9	JB
10061-02-6	trans-1,3-Dichloropropene	13	U
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	32	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-5

Sample wt/vol: 2.55(g/mL) G Lab File ID: S2788-5A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 23 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	13	U
75-25-2	Bromoform	13	U
98-82-8	Isopropyl Benzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-Chloropropane	13	U
120-82-1	1,2,4-Trichlorobenzene	13	U
1330-20-7	Xylene (total)	21	J
79-20-9	Methyl acetate	13	U
110-82-7	Cyclohexane	13	U
108-87-2	Methylcyclohexane	13	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-5

Sample wt/vol: 2.55 (g/mL) G Lab File ID: S2788-5A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 23 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-2

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 4.94(g/mL) G Lab File ID: S2788-10A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 27 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U UJ,C
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	52	
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	60	
75-09-2	Methylene Chloride	3	J B,X
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	17	U
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	1	J
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	4	J
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	17	U
108-88-3	Toluene	16	B
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	17	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-2

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 4.94(g/mL) G Lab File ID: S2788-10A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 27 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	11	
100-42-5	Styrene	7	U
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	7	U
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	45	
79-20-9	Methyl acetate	1	J
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-2

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 4.94 (g/mL) G Lab File ID: S2788-10A61

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 27 Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-2RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 4.79(g/mL) G Lab File ID: S2788-10RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 27 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U UL,h
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	6	J L,h
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	J
67-64-1	Acetone	15	J
75-09-2	Methylene Chloride	2	J B,z
156-60-5	trans-1,2-Dichloroethene	7	U UL,h
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	18	U
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	7	U
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	0.8	J L,h
78-87-5	1,2-Dichloropropane	7	U UL,h
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	18	U
108-88-3	Toluene	3	JB B,z
10061-02-6	trans-1,3-Dichloropropene	7	U UL,h
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	18	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

Do not use RA

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-2RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 4.79(g/mL) G Lab File ID: S2788-10RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 27 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
108-90-7	Chlorobenzene		7	U
100-41-4	Ethylbenzene		7	U
100-42-5	Styrene		7	U
75-25-2	Bromoform		7	U
98-82-8	Isopropyl Benzene		7	U
79-34-5	1,1,2,2-Tetrachloroethane		7	U
541-73-1	1,3-Dichlorobenzene		7	U
106-46-7	1,4-Dichlorobenzene		7	U
95-50-1	1,2-Dichlorobenzene		7	U
96-12-8	1,2-Dibromo-3-Chloropropane		7	U
120-82-1	1,2,4-Trichlorobenzene		7	U
1330-20-7	Xylene (total)		2	J
79-20-9	Methyl acetate		7	U
110-82-7	Cyclohexane		7	U
108-87-2	Methylcyclohexane		7	U

DO NOT USE

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-2RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 4.79 (g/mL) G Lab File ID: S2788-10RB59

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: not dec. 27 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	~~13.84~~	~~11.24~~	~~J~~
2.		BRANCHED ALKANE	14.02	9.69	J NJ
3.		BRANCHED ALKANE	14.05	8.47	J
4.		~~UNKNOWN~~	~~14.27~~	~~8.07~~	~~J~~
5.		~~UNKNOWN~~	~~14.31~~	~~19.77~~	~~J~~
6.		~~UNKNOWN~~	~~14.38~~	~~7.78~~	~~J~~
7.		BRANCHED ALKANE	14.60	7.24	J
8.		~~UNKNOWN~~	~~14.72~~	~~16.65~~	~~J~~
9.		~~LABORATORY ARTIFACT~~	~~14.89~~	~~15.13~~	~~J~~
10.	124-19-6	NONANAL	15.15	14.81	NJ NJ
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-3

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 3.59(g/mL) G Lab File ID: S2788-14A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 32 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	3	J
75-35-4	1,1-Dichloroethene	10	U
75-15-0	Carbon disulfide	110	
76-13-1	1,1,2-trichloro-1,2,2-triflu	2	JB B1Z
67-64-1	Acetone	570	
75-09-2	Methylene Chloride	16	B,Z
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl-tert-butyl ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	3	J
78-93-3	2-butanone	130	
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	74	
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	J
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	26	U
108-88-3	Toluene	29	B
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-hexanone	26	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U

DO NOT USE RA

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-3

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 3.59(g/mL) G Lab File ID: S2788-14A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 32 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	2000	E
100-41-4	Ethylbenzene	12	
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropyl Benzene	23	
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	8	J
106-46-7	1,4-Dichlorobenzene	72	
95-50-1	1,2-Dichlorobenzene	10	J
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	22	B
1330-20-7	Xylene (total)	61	
79-20-9	Methyl acetate	10	U
110-82-7	Cyclohexane	9	J
108-87-2	Methylcyclohexane	23	

Do Not use

Rev

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-3

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 3.59 (g/mL) G Lab File ID: S2788-14A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 32 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		BRANCHED ALKANE	15.40	125.8	J NJ1 t
2.		CYCLIC ALKANE	15.65	134.0	J
3.		SUBSTITUTED NAPHTHALENE	16.04	135.0	J
4.		~~UNKNOWN~~	~~16.22~~	~~84.45~~	~~J~~
5.		BRANCHED ALKANE	16.23	93.06	J NJ1 t
6.		~~UNKNOWN~~	~~16.37~~	~~95.98~~	~~J~~
7.		CYCLIC ALKANE	16.46	84.30	J NJ1 t
8.		BRANCHED ALKANE	16.56	76.73	J
9.		BRANCHED ALKANE	16.84	119.9	J
10.		BRANCHED ALKANE	17.23	71.29	J
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-3RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 3.58(g/mL) G Lab File ID: S2788-14DA59

Level: (low/med) MED Date Received: 11/15/02

% Moisture: not dec. 32 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:(5000)(ul) Soil Aliquot Volume: 100(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	510	U
74-87-3	Chloromethane	510	U
75-01-4	Vinyl Chloride	510	U
74-83-9	Bromomethane	510	U
75-00-3	Chloroethane	510	U
75-69-4	Trichlorofluoromethane	510	U
75-35-4	1,1-Dichloroethene	510	U
75-15-0	Carbon disulfide	160	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	510	U
67-64-1	Acetone	1300	U
75-09-2	Methylene Chloride	510	U
156-60-5	trans-1,2-Dichloroethene	510	U
1634-04-4	Methyl-tert-butyl ether	510	U
75-34-3	1,1-Dichloroethane	510	U
156-59-2	cis-1,2-Dichloroethene	510	U
78-93-3	2-butanone	1300	U
67-66-3	Chloroform	510	U
71-55-6	1,1,1-Trichloroethane	510	U
56-23-5	Carbon Tetrachloride	510	U
71-43-2	Benzene	470	J
107-06-2	1,2-Dichloroethane	510	U
79-01-6	Trichloroethene	510	U
78-87-5	1,2-Dichloropropane	510	U
75-27-4	Bromodichloromethane	510	U
10061-01-5	cis-1,3-Dichloropropene	510	U
108-10-1	4-Methyl-2-pentanone	1300	U
108-88-3	Toluene	520	B
10061-02-6	trans-1,3-Dichloropropene	510	U
79-00-5	1,1,2-Trichloroethane	510	U
127-18-4	Tetrachloroethene	510	U
591-78-6	2-hexanone	1300	U
124-48-1	Dibromochloromethane	510	U
106-93-4	1,2-Dibromoethane	510	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-3RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 3.58(g/mL) G Lab File ID: S2788-14DA59

Level: (low/med) MED Date Received: 11/15/02

% Moisture: not dec. 32 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:(5000)(ul) Soil Aliquot Volume: 100(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	15000	Lin
100-41-4	Ethylbenzene	740	↓
100-42-5	Styrene	510	U Ulin
75-25-2	Bromoform	510	U ↓
98-82-8	Isopropyl Benzene	130	J Lin
79-34-5	1,1,2,2-Tetrachloroethane	510	U Ulin
541-73-1	1,3-Dichlorobenzene	510	U ↓
106-46-7	1,4-Dichlorobenzene	1100	Lin
95-50-1	1,2-Dichlorobenzene	510	U Ulin
96-12-8	1,2-Dibromo-3-Chloropropane	510	U ↓
120-82-1	1,2,4-Trichlorobenzene	510	U ↓
1330-20-7	Xylene (total)	1600	Lin
79-20-9	Methyl acetate	810	↓
110-82-7	Cyclohexane	150	J
108-87-2	Methylcyclohexane	420	J ↓

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-3RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 3.58 (g/mL) G Lab File ID: S2788-14DA59

Level: (low/med) MED Date Received: 11/15/02

% Moisture: not dec. 32 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5000(ul) Soil Aliquot Volume: 100(ul

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	~~13.82~~	~~605.4~~	~~J~~ 2
2.	527-84-4	BENZENE, 1-METHYL-2-(1-METHY	14.40	2109	NJ NJ
3.	91-17-8	NAPHTHALENE, DECAHYDRO-	14.74	531.9	NJ
4.		SUBSTITUTED BENZENE	14.90	535.0	J
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-4

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 3.35(g/mL) G Lab File ID: S2788-17A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	11	U
74-87-3	Chloromethane	11	U
75-01-4	Vinyl Chloride	11	U
74-83-9	Bromomethane	11	U
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-15-0	Carbon disulfide	11	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	6	JB
67-64-1	Acetone	170	
75-09-2	Methylene Chloride	24	B1F
156-60-5	trans-1,2-Dichloroethene	11	U
1634-04-4	Methyl-tert-butyl ether	11	U
75-34-3	1,1-Dichloroethane	11	U
156-59-2	cis-1,2-Dichloroethene	11	U
78-93-3	2-butanone	27	U
67-66-3	Chloroform	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
71-43-2	Benzene	11	U
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	21	
78-87-5	1,2-Dichloropropane	11	U
75-27-4	Bromodichloromethane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-10-1	4-Methyl-2-pentanone	27	U
108-88-3	Toluene	6	JB B1Z
10061-02-6	trans-1,3-Dichloropropene	11	U
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
591-78-6	2-hexanone	27	U
124-48-1	Dibromochloromethane	11	U
106-93-4	1,2-Dibromoethane	11	U

Do Not Use RA

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FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-4

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 3.35(g/mL) G Lab File ID: S2788-17A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
75-25-2	Bromoform	11	U
98-82-8	Isopropyl Benzene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	11	U
95-50-1	1,2-Dichlorobenzene	11	U
96-12-8	1,2-Dibromo-3-Chloropropane	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
1330-20-7	Xylene (total)	3	J
79-20-9	Methyl acetate	11	U
110-82-7	Cyclohexane	11	U
108-87-2	Methylcyclohexane	11	U

DO NOT USE RA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-4

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 3.35 (g/mL) G Lab File ID: S2788-17A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	~~4.28~~	~~10.83~~	~~J~~
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-4RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 2.80(g/mL) G Lab File ID: S2788-17RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	13	U UL,h
74-87-3	Chloromethane	13	U
75-01-4	Vinyl Chloride	13	U
74-83-9	Bromomethane	13	U
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
75-15-0	Carbon disulfide	13	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	36	L,h
75-09-2	Methylene Chloride	3	J
156-60-5	trans-1,2-Dichloroethene	13	U UL,h
1634-04-4	Methyl-tert-butyl ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	32	U
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
71-43-2	Benzene	13	U
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	9	J L,h
78-87-5	1,2-Dichloropropane	13	U UL,h
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	32	U
108-88-3	Toluene	3	JB B,h
10061-02-6	trans-1,3-Dichloropropene	13	U UL,h
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	32	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-4RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 2.80(g/mL) G Lab File ID: S2788-17RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
100-42-5	Styrene	13	U
75-25-2	Bromoform	13	U
98-82-8	Isopropyl Benzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-Chloropropane	13	U
120-82-1	1,2,4-Trichlorobenzene	13	U
1330-20-7	Xylene (total)	3	J
79-20-9	Methyl acetate	13	U
110-82-7	Cyclohexane	13	U
108-87-2	Methylcyclohexane	13	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-4RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 2.80 (g/mL) G Lab File ID: S2788-17RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 31 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~13.52~~	~~27.58~~	~~J~~
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FORM I VOA-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-1RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U VJC
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-1RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	780	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U RIC
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	48	J
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	49	J
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-1RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	460	JB
2.		UNKNOWN (BC)	5.69	1400	JB
3.		UNKNOWN	22.19	170	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-3B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 29 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	460	U
108-95-2	Phenol	460	U
111-44-4	Bis(2-chloroethyl)ether	460	U
95-57-8	2-Chlorophenol	460	U
95-48-7	2-Methylphenol	460	U
108-60-1	2,2'-oxybis(1-Chloropropane)	460	U
98-86-2	Acetophenone	460	U
106-44-5	4-Methylphenol	460	U
621-64-7	N-Nitroso-di-N-propylamine	460	U
67-72-1	Hexachloroethane	460	U
98-95-3	Nitrobenzene	460	U
78-59-1	Isophorone	460	U
88-75-5	2-Nitrophenol	460	U
105-67-9	2,4-Dimethylphenol	460	U
111-91-1	Bis(2-chloroethoxy)methane	460	U
120-83-2	2,4-Dichlorophenol	460	U
91-20-3	Naphthalene	460	U
106-47-8	4-Chloroaniline	460	U
87-68-3	Hexachlorobutadiene	460	U
105-60-2	Caprolactam	460	U
59-50-7	4-Chloro-3-methylphenol	460	U
91-57-6	2-Methylnaphthalene	460	U
77-47-4	Hexachlorocyclopentadiene	460	U
88-06-2	2,4,6-Trichlorophenol	460	U
95-95-4	2,4,5-Trichlorophenol	460	U
92-52-4	1,1'-Biphenyl	460	U
91-58-7	2-Chloronaphthalene	460	U
88-74-4	2-Nitroaniline	930	U
131-11-3	Dimethylphthalate	460	U
606-20-2	2,6-Dinitrotoluene	460	U
208-96-8	Acenaphthylene	460	U
99-09-2	3-Nitroaniline	930	U
83-32-9	Acenaphthene	460	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-3B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 29 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2300	U
100-02-7	4-Nitrophenol	930	U
121-14-2	2,4-Dinitrotoluene	460	U
132-64-9	Dibenzofuran	460	U
84-66-2	Diethylphthalate	460	U
7005-72-3	4-Chlorophenyl-phenylether	460	U
86-73-7	Fluorene	460	U
100-01-6	4-Nitroaniline	930	U
534-52-1	4,6-Dinitro-2-methylphenol	930	U
86-30-6	N-Nitrosodiphenylamine (1)	930	U
101-55-3	4-Bromophenyl-phenylether	460	U
118-74-1	Hexachlorobenzene	460	U
1912-24-9	Atrazine	460	UJ,r
87-86-5	Pentachlorophenol	460	U
85-01-8	Phenanthrene	460	U
120-12-7	Anthracene	460	U
86-74-8	Carbazole	460	U
84-74-2	Di-n-butylphthalate	460	U
206-44-0	Fluoranthene	460	U
129-00-0	Pyrene	460	U
85-68-7	Butylbenzylphthalate	460	U
91-94-1	3,3'-Dichlorobenzidine	460	U
117-81-7	bis(2-ethylhexyl)Phthalate	110	J
56-55-3	Benzo(a)anthracene	460	U
218-01-9	Chrysene	460	U
117-84-0	Di-n-octylphthalate	460	U
205-99-2	Benzo(b)fluoranthene	460	U
207-08-9	Benzo(k)fluoranthene	460	U
50-32-8	Benzo(a)pyrene	460	U
193-39-5	Indeno(1,2,3-cd)pyrene	460	U
53-70-3	Dibenzo(a,h)anthracene	460	U
191-24-2	Benzo(g,h,i)perylene	460	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-3B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 29 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	700	JB
2.		UNKNOWN (BC)	5.76	510	JB
3.		UNKNOWN	6.24	190	J
4.		UNKNOWN	7.03	260	J
5.		UNKNOWN	14.36	390	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-4B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 32 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	490	U
108-95-2	Phenol	490	U
111-44-4	Bis(2-chloroethyl)ether	490	U
95-57-8	2-Chlorophenol	490	U
95-48-7	2-Methylphenol	490	U
108-60-1	2,2'-oxybis(1-Chloropropane)	490	U
98-86-2	Acetophenone	490	U
106-44-5	4-Methylphenol	490	U
621-64-7	N-Nitroso-di-N-propylamine	490	U
67-72-1	Hexachloroethane	490	U
98-95-3	Nitrobenzene	490	U
78-59-1	Isophorone	490	U
88-75-5	2-Nitrophenol	490	U
105-67-9	2,4-Dimethylphenol	490	U
111-91-1	Bis(2-chloroethoxy)methane	490	U
120-83-2	2,4-Dichlorophenol	490	U
91-20-3	Naphthalene	490	U
106-47-8	4-Chloroaniline	490	U
87-68-3	Hexachlorobutadiene	490	U
105-60-2	Caprolactam	490	U
59-50-7	4-Chloro-3-methylphenol	490	U
91-57-6	2-Methylnaphthalene	490	U
77-47-4	Hexachlorocyclopentadiene	490	U
88-06-2	2,4,6-Trichlorophenol	490	U
95-95-4	2,4,5-Trichlorophenol	490	U
92-52-4	1,1'-Biphenyl	490	U
91-58-7	2-Chloronaphthalene	490	U
88-74-4	2-Nitroaniline	980	U
131-11-3	Dimethylphthalate	490	U
606-20-2	2,6-Dinitrotoluene	490	U
208-96-8	Acenaphthylene	490	U
99-09-2	3-Nitroaniline	980	U
83-32-9	Acenaphthene	490	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-4B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 32 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2500	U
100-02-7	4-Nitrophenol	980	U
121-14-2	2,4-Dinitrotoluene	490	U
132-64-9	Dibenzofuran	490	U
84-66-2	Diethylphthalate	490	U
7005-72-3	4-Chlorophenyl-phenylether	490	U
86-73-7	Fluorene	490	U
100-01-6	4-Nitroaniline	980	U
534-52-1	4,6-Dinitro-2-methylphenol	980	U
86-30-6	N-Nitrosodiphenylamine (1)	980	U
101-55-3	4-Bromophenyl-phenylether	490	U
118-74-1	Hexachlorobenzene	490	U
1912-24-9	Atrazine	490	U UJ JR
87-86-5	Pentachlorophenol	490	U
85-01-8	Phenanthrene	490	U
120-12-7	Anthracene	490	U
86-74-8	Carbazole	490	U
84-74-2	Di-n-butylphthalate	490	U
206-44-0	Fluoranthene	490	U
129-00-0	Pyrene	490	U
85-68-7	Butylbenzylphthalate	490	U
91-94-1	3,3'-Dichlorobenzidine	490	U
117-81-7	bis(2-ethylhexyl)Phthalate	490	U
56-55-3	Benzo(a)anthracene	490	U
218-01-9	Chrysene	490	U
117-84-0	Di-n-octylphthalate	490	U
205-99-2	Benzo(b)fluoranthene	490	U
207-08-9	Benzo(k)fluoranthene	490	U
50-32-8	Benzo(a)pyrene	490	U
193-39-5	Indeno(1,2,3-cd)pyrene	490	U
53-70-3	Dibenzo(a,h)anthracene	490	U
191-24-2	Benzo(g,h,i)perylene	490	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-4B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 32 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.49	~~750~~	~~JB~~
2.		UNKNOWN (BC)	5.76	620	JB
3.		UNKNOWN	6.23	260	J
4.		~~UNKNOWN~~	7.03	~~320~~	J
5.	10544-50-0	SULFUR, MOL. (S8) RA 2/14/03	14.35	2200	NJ NJ, t
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-2B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-2B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	810	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	810	U
534-52-1	4,6-Dinitro-2-methylphenol	810	U
86-30-6	N-Nitrosodiphenylamine (1)	810	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U UJ,R
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	36	J
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-2B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	500	JB
2.		UNKNOWN (BC)	5.76	410	JB
3.		UNKNOWN (BC)	7.03	410	JB
4.		UNKNOWN (BC)	7.38	220	JB
5.		UNKNOWN (BC)	7.77	200	JB
6.		UNKNOWN	10.11	250	J
7.	10544-50-0	SULFUR, MOL. (S8)	14.35	2200	NJ NJ
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-18A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 22 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	850	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	850	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-18A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 22 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	850	U
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	850	U
534-52-1	4,6-Dinitro-2-methylphenol	850	U
86-30-6	N-Nitrosodiphenylamine (1)	850	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	UJ|V
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	420	U
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	U
206-44-0	Fluoranthene	420	U
129-00-0	Pyrene	420	U
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	420	U
56-55-3	Benzo(a)anthracene	420	U
218-01-9	Chrysene	420	U
117-84-0	Di-n-octylphthalate	420	U
205-99-2	Benzo(b)fluoranthene	420	U
207-08-9	Benzo(k)fluoranthene	420	U
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	420	U
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	420	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-18A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 22 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.48	760	JB
2.		UNKNOWN (BC)	5.76	1200	JB
3.		UNKNOWN	19.55	320	J
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RA 2/18/03

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-19A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 37 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	520	U
108-95-2	Phenol	520	U
111-44-4	Bis(2-chloroethyl)ether	520	U
95-57-8	2-Chlorophenol	520	U
95-48-7	2-Methylphenol	520	U
108-60-1	2,2'-oxybis(1-Chloropropane)	520	U
98-86-2	Acetophenone	520	U
106-44-5	4-Methylphenol	520	U
621-64-7	N-Nitroso-di-N-propylamine	520	U
67-72-1	Hexachloroethane	520	U
98-95-3	Nitrobenzene	520	U
78-59-1	Isophorone	520	U
88-75-5	2-Nitrophenol	520	U
105-67-9	2,4-Dimethylphenol	520	U
111-91-1	Bis(2-chloroethoxy)methane	520	U
120-83-2	2,4-Dichlorophenol	520	U
91-20-3	Naphthalene	520	U
106-47-8	4-Chloroaniline	520	U
87-68-3	Hexachlorobutadiene	520	U
105-60-2	Caprolactam	520	U
59-50-7	4-Chloro-3-methylphenol	520	U
91-57-6	2-Methylnaphthalene	520	U
77-47-4	Hexachlorocyclopentadiene	520	U
88-06-2	2,4,6-Trichlorophenol	520	U
95-95-4	2,4,5-Trichlorophenol	520	U
92-52-4	1,1'-Biphenyl	520	U
91-58-7	2-Chloronaphthalene	520	U
88-74-4	2-Nitroaniline	1000	U
131-11-3	Dimethylphthalate	520	U
606-20-2	2,6-Dinitrotoluene	520	U
208-96-8	Acenaphthylene	520	U
99-09-2	3-Nitroaniline	1000	U
83-32-9	Acenaphthene	520	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-19A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 37 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2600	U
100-02-7	4-Nitrophenol	1000	U
121-14-2	2,4-Dinitrotoluene	520	U
132-64-9	Dibenzofuran	520	U
84-66-2	Diethylphthalate	520	U
7005-72-3	4-Chlorophenyl-phenylether	520	U
86-73-7	Fluorene	520	U
100-01-6	4-Nitroaniline	1000	U
534-52-1	4,6-Dinitro-2-methylphenol	1000	U
86-30-6	N-Nitrosodiphenylamine (1)	1000	U
101-55-3	4-Bromophenyl-phenylether	520	U
118-74-1	Hexachlorobenzene	520	U
1912-24-9	Atrazine	520	U UJ
87-86-5	Pentachlorophenol	520	U
85-01-8	Phenanthrene	520	U
120-12-7	Anthracene	520	U
86-74-8	Carbazole	520	U
84-74-2	Di-n-butylphthalate	520	U
206-44-0	Fluoranthene	520	U
129-00-0	Pyrene	520	U
85-68-7	Butylbenzylphthalate	520	U
91-94-1	3,3'-Dichlorobenzidine	520	U
117-81-7	bis(2-ethylhexyl)Phthalate	520	U
56-55-3	Benzo(a)anthracene	520	U
218-01-9	Chrysene	520	U
117-84-0	Di-n-octylphthalate	520	U
205-99-2	Benzo(b)fluoranthene	520	U
207-08-9	Benzo(k)fluoranthene	520	U
50-32-8	Benzo(a)pyrene	520	U
193-39-5	Indeno(1,2,3-cd)pyrene	520	U
53-70-3	Dibenzo(a,h)anthracene	520	U
191-24-2	Benzo(g,h,i)perylene	520	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-19A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 37 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.49	~~970~~	~~JB~~
2.		~~UNKNOWN (BC)~~	5.76	~~800~~	~~JB~~
3.	10544-50-0	SULFUR, MOL. (S8)	14.33	250	NJ NJ, t
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-20A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 31 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	480	U
108-95-2	Phenol	480	U
111-44-4	Bis(2-chloroethyl)ether	480	U
95-57-8	2-Chlorophenol	480	U
95-48-7	2-Methylphenol	480	U
108-60-1	2,2'-oxybis(1-Chloropropane)	480	U
98-86-2	Acetophenone	480	U
106-44-5	4-Methylphenol	480	U
621-64-7	N-Nitroso-di-N-propylamine	480	U
67-72-1	Hexachloroethane	480	U
98-95-3	Nitrobenzene	480	U
78-59-1	Isophorone	480	U
88-75-5	2-Nitrophenol	480	U
105-67-9	2,4-Dimethylphenol	480	U
111-91-1	Bis(2-chloroethoxy)methane	480	U
120-83-2	2,4-Dichlorophenol	480	U
91-20-3	Naphthalene	480	U
106-47-8	4-Chloroaniline	480	U
87-68-3	Hexachlorobutadiene	480	U
105-60-2	Caprolactam	480	U
59-50-7	4-Chloro-3-methylphenol	480	U
91-57-6	2-Methylnaphthalene	480	U
77-47-4	Hexachlorocyclopentadiene	480	U
88-06-2	2,4,6-Trichlorophenol	480	U
95-95-4	2,4,5-Trichlorophenol	480	U
92-52-4	1,1'-Biphenyl	480	U
91-58-7	2-Chloronaphthalene	480	U
88-74-4	2-Nitroaniline	950	U
131-11-3	Dimethylphthalate	480	U
606-20-2	2,6-Dinitrotoluene	480	U
208-96-8	Acenaphthylene	480	U
99-09-2	3-Nitroaniline	950	U
83-32-9	Acenaphthene	480	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-20A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 31 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2400	U
100-02-7	4-Nitrophenol	950	U
121-14-2	2,4-Dinitrotoluene	480	U
132-64-9	Dibenzofuran	480	U
84-66-2	Diethylphthalate	480	U
7005-72-3	4-Chlorophenyl-phenylether	480	U
86-73-7	Fluorene	480	U
100-01-6	4-Nitroaniline	950	U
534-52-1	4,6-Dinitro-2-methylphenol	950	U
86-30-6	N-Nitrosodiphenylamine (1)	950	U
101-55-3	4-Bromophenyl-phenylether	480	U
118-74-1	Hexachlorobenzene	480	U
1912-24-9	Atrazine	480	U JV
87-86-5	Pentachlorophenol	480	U
85-01-8	Phenanthrene	480	U
120-12-7	Anthracene	480	U
86-74-8	Carbazole	480	U
84-74-2	Di-n-butylphthalate	480	U
206-44-0	Fluoranthene	480	U
129-00-0	Pyrene	480	U
85-68-7	Butylbenzylphthalate	480	U
91-94-1	3,3'-Dichlorobenzidine	480	U
117-81-7	bis(2-ethylhexyl)Phthalate	480	U
56-55-3	Benzo(a)anthracene	480	U
218-01-9	Chrysene	480	U
117-84-0	Di-n-octylphthalate	480	U
205-99-2	Benzo(b)fluoranthene	480	U
207-08-9	Benzo(k)fluoranthene	480	U
50-32-8	Benzo(a)pyrene	480	U
193-39-5	Indeno(1,2,3-cd)pyrene	480	U
53-70-3	Dibenzo(a,h)anthracene	480	U
191-24-2	Benzo(g,h,i)perylene	480	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-20A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 31 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.47~~	~~970~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.76~~	~~1500~~	~~JB~~
3.	57-10-3	HEXADECANOIC ACID	13.00	300	NJ
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-15A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 26 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	440	U
108-95-2	Phenol	440	U
111-44-4	Bis(2-chloroethyl)ether	440	U
95-57-8	2-Chlorophenol	440	U
95-48-7	2-Methylphenol	440	U
108-60-1	2,2'-oxybis(1-Chloropropane)	440	U
98-86-2	Acetophenone	440	U
106-44-5	4-Methylphenol	440	U
621-64-7	N-Nitroso-di-N-propylamine	440	U
67-72-1	Hexachloroethane	440	U
98-95-3	Nitrobenzene	440	U
78-59-1	Isophorone	440	U
88-75-5	2-Nitrophenol	440	U
105-67-9	2,4-Dimethylphenol	440	U
111-91-1	Bis(2-chloroethoxy)methane	440	U
120-83-2	2,4-Dichlorophenol	440	U
91-20-3	Naphthalene	440	U
106-47-8	4-Chloroaniline	440	U
87-68-3	Hexachlorobutadiene	440	U
105-60-2	Caprolactam	440	U
59-50-7	4-Chloro-3-methylphenol	440	U
91-57-6	2-Methylnaphthalene	440	U
77-47-4	Hexachlorocyclopentadiene	440	U
88-06-2	2,4,6-Trichlorophenol	440	U
95-95-4	2,4,5-Trichlorophenol	440	U
92-52-4	1,1'-Biphenyl	440	U
91-58-7	2-Chloronaphthalene	440	U
88-74-4	2-Nitroaniline	890	U
131-11-3	Dimethylphthalate	440	U
606-20-2	2,6-Dinitrotoluene	440	U
208-96-8	Acenaphthylene	440	U
99-09-2	3-Nitroaniline	890	U
83-32-9	Acenaphthene	440	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-15A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 26 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	890	U
121-14-2	2,4-Dinitrotoluene	440	U
132-64-9	Dibenzofuran	440	U
84-66-2	Diethylphthalate	440	U
7005-72-3	4-Chlorophenyl-phenylether	440	U
86-73-7	Fluorene	440	U
100-01-6	4-Nitroaniline	890	U
534-52-1	4,6-Dinitro-2-methylphenol	890	U
86-30-6	N-Nitrosodiphenylamine (1)	890	U
101-55-3	4-Bromophenyl-phenylether	440	U
118-74-1	Hexachlorobenzene	440	U
1912-24-9	Atrazine	440	U
87-86-5	Pentachlorophenol	440	U
85-01-8	Phenanthrene	440	U
120-12-7	Anthracene	440	U
86-74-8	Carbazole	440	U
84-74-2	Di-n-butylphthalate	440	U
206-44-0	Fluoranthene	440	U
129-00-0	Pyrene	440	U
85-68-7	Butylbenzylphthalate	440	U
91-94-1	3,3'-Dichlorobenzidine	440	U
117-81-7	bis(2-ethylhexyl)Phthalate	55	J
56-55-3	Benzo(a)anthracene	440	U
218-01-9	Chrysene	440	U
117-84-0	Di-n-octylphthalate	440	U
205-99-2	Benzo(b)fluoranthene	440	U
207-08-9	Benzo(k)fluoranthene	440	U
50-32-8	Benzo(a)pyrene	440	U
193-39-5	Indeno(1,2,3-cd)pyrene	440	U
53-70-3	Dibenzo(a,h)anthracene	440	U
191-24-2	Benzo(g,h,i)perylene	440	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-15A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 26 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.48~~	~~1100~~	~~JB~~
2.		UNKNOWN (BC)	5.76	2000	JB
3.		~~UNKNOWN~~	10.04	~~180~~	J
4.	10544-50-0	SULFUR, MOL. (S8)	14.34	960	NJ NJ, b
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-16A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 33 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	500	U
108-95-2	Phenol	500	U
111-44-4	Bis(2-chloroethyl)ether	500	U
95-57-8	2-Chlorophenol	500	U
95-48-7	2-Methylphenol	500	U
108-60-1	2,2'-oxybis(1-Chloropropane)	500	U
98-86-2	Acetophenone	500	U
106-44-5	4-Methylphenol	500	U
621-64-7	N-Nitroso-di-N-propylamine	500	U
67-72-1	Hexachloroethane	500	U
98-95-3	Nitrobenzene	500	U
78-59-1	Isophorone	500	U
88-75-5	2-Nitrophenol	500	U
105-67-9	2,4-Dimethylphenol	500	U
111-91-1	Bis(2-chloroethoxy)methane	500	U
120-83-2	2,4-Dichlorophenol	500	U
91-20-3	Naphthalene	500	U
106-47-8	4-Chloroaniline	500	U
87-68-3	Hexachlorobutadiene	500	U
105-60-2	Caprolactam	500	U
59-50-7	4-Chloro-3-methylphenol	500	U
91-57-6	2-Methylnaphthalene	500	U
77-47-4	Hexachlorocyclopentadiene	500	U
88-06-2	2,4,6-Trichlorophenol	500	U
95-95-4	2,4,5-Trichlorophenol	500	U
92-52-4	1,1'-Biphenyl	500	U
91-58-7	2-Chloronaphthalene	500	U
88-74-4	2-Nitroaniline	990	U
131-11-3	Dimethylphthalate	500	U
606-20-2	2,6-Dinitrotoluene	500	U
208-96-8	Acenaphthylene	500	U
99-09-2	3-Nitroaniline	990	U
83-32-9	Acenaphthene	500	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-16A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 33 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2500	U
100-02-7	4-Nitrophenol	990	U
121-14-2	2,4-Dinitrotoluene	500	U
132-64-9	Dibenzofuran	500	U
84-66-2	Diethylphthalate	500	U
7005-72-3	4-Chlorophenyl-phenylether	500	U
86-73-7	Fluorene	500	U
100-01-6	4-Nitroaniline	990	U
534-52-1	4,6-Dinitro-2-methylphenol	990	U
86-30-6	N-Nitrosodiphenylamine (1)	990	U
101-55-3	4-Bromophenyl-phenylether	500	U
118-74-1	Hexachlorobenzene	500	U
1912-24-9	Atrazine	500	U UJ IV
87-86-5	Pentachlorophenol	500	U
85-01-8	Phenanthrene	500	U
120-12-7	Anthracene	500	U
86-74-8	Carbazole	500	U
84-74-2	Di-n-butylphthalate	500	U
206-44-0	Fluoranthene	500	U
129-00-0	Pyrene	500	U
85-68-7	Butylbenzylphthalate	500	U
91-94-1	3,3'-Dichlorobenzidine	500	U
117-81-7	bis(2-ethylhexyl)Phthalate	63	J
56-55-3	Benzo(a)anthracene	500	U
218-01-9	Chrysene	500	U
117-84-0	Di-n-octylphthalate	500	U
205-99-2	Benzo(b)fluoranthene	500	U
207-08-9	Benzo(k)fluoranthene	500	U
50-32-8	Benzo(a)pyrene	500	U
193-39-5	Indeno(1,2,3-cd)pyrene	500	U
53-70-3	Dibenzo(a,h)anthracene	500	U
191-24-2	Benzo(g,h,i)perylene	500	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-16A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 33 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	920	JB
2.		UNKNOWN (BC)	5.77	2100	JB
3.		UNKNOWN	6.23	210	J
4.	10544-50-0	SULFUR, MOL. (S8)	14.35	270	NJ NJ$_L$ C
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-11B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	40	J
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-11B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	35	J
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	800	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U OJ, V
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	140	J
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	150	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-11B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	590	JB
2.		UNKNOWN (BC)	5.76	850	JB
3.		UNKNOWN	6.94	170	J
4.		UNKNOWN (BC)	7.08	430	JB
5.		UNKNOWN (BC)	7.43	190	JB
6.		UNKNOWN	11.87	200	J
7.	10544-50-0	SULFUR, MOL. (S8)	14.37	3600	NJ NJ,
8.		STRAIGHT-CHAIN ALKANE	21.09	270	J
9.		UNKNOWN	22.35	260	J
10.		UNKNOWN	22.44	190	J
11.		UNKNOWN	22.57	240	J
12.		UNKNOWN	22.64	200	J
13.		UNKNOWN	23.10	170	J
14.		UNKNOWN	23.17	180	J
15.		UNKNOWN	23.34	620	J
16.		UNKNOWN	23.72	160	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-13B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 26 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	450	U
108-95-2	Phenol	450	U
111-44-4	Bis(2-chloroethyl)ether	450	U
95-57-8	2-Chlorophenol	450	U
95-48-7	2-Methylphenol	450	U
108-60-1	2,2'-oxybis(1-Chloropropane)	450	U
98-86-2	Acetophenone	450	U
106-44-5	4-Methylphenol	450	U
621-64-7	N-Nitroso-di-N-propylamine	450	U
67-72-1	Hexachloroethane	450	U
98-95-3	Nitrobenzene	450	U
78-59-1	Isophorone	450	U
88-75-5	2-Nitrophenol	450	U
105-67-9	2,4-Dimethylphenol	450	U
111-91-1	Bis(2-chloroethoxy)methane	450	U
120-83-2	2,4-Dichlorophenol	450	U
91-20-3	Naphthalene	450	U
106-47-8	4-Chloroaniline	450	U
87-68-3	Hexachlorobutadiene	450	U
105-60-2	Caprolactam	450	U
59-50-7	4-Chloro-3-methylphenol	450	U
91-57-6	2-Methylnaphthalene	450	U
77-47-4	Hexachlorocyclopentadiene	450	U
88-06-2	2,4,6-Trichlorophenol	450	U
95-95-4	2,4,5-Trichlorophenol	450	U
92-52-4	1,1'-Biphenyl	450	U
91-58-7	2-Chloronaphthalene	450	U
88-74-4	2-Nitroaniline	900	U
131-11-3	Dimethylphthalate	450	U
606-20-2	2,6-Dinitrotoluene	450	U
208-96-8	Acenaphthylene	450	U
99-09-2	3-Nitroaniline	900	U
83-32-9	Acenaphthene	450	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-13B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 26 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2300	U
100-02-7	4-Nitrophenol	900	U
121-14-2	2,4-Dinitrotoluene	450	U
132-64-9	Dibenzofuran	450	U
84-66-2	Diethylphthalate	450	U
7005-72-3	4-Chlorophenyl-phenylether	450	U
86-73-7	Fluorene	450	U
100-01-6	4-Nitroaniline	900	U
534-52-1	4,6-Dinitro-2-methylphenol	900	U
86-30-6	N-Nitrosodiphenylamine (1)	900	U
101-55-3	4-Bromophenyl-phenylether	450	U
118-74-1	Hexachlorobenzene	450	U
1912-24-9	Atrazine	450	U UJ,R
87-86-5	Pentachlorophenol	450	U
85-01-8	Phenanthrene	450	U
120-12-7	Anthracene	450	U
86-74-8	Carbazole	450	U
84-74-2	Di-n-butylphthalate	450	U
206-44-0	Fluoranthene	450	U
129-00-0	Pyrene	450	U
85-68-7	Butylbenzylphthalate	450	U
91-94-1	3,3'-Dichlorobenzidine	450	U
117-81-7	bis(2-ethylhexyl)Phthalate	89	J
56-55-3	Benzo(a)anthracene	450	U
218-01-9	Chrysene	450	U
117-84-0	Di-n-octylphthalate	450	U
205-99-2	Benzo(b)fluoranthene	450	U
207-08-9	Benzo(k)fluoranthene	450	U
50-32-8	Benzo(a)pyrene	450	U
193-39-5	Indeno(1,2,3-cd)pyrene	450	U
53-70-3	Dibenzo(a,h)anthracene	450	U
191-24-2	Benzo(g,h,i)perylene	450	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-13B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 26 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 13

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	570	JB
2.		UNKNOWN (BC)	5.76	820	JB
3.		UNKNOWN (BC)	7.03	310	JB
4.		UNKNOWN (BC)	7.39	190	JB
5.		UNKNOWN	10.23	5200	J
6.		UNKNOWN	11.34	200	J
7.		UNKNOWN	11.94	1700	J
8.	10544-50-0	SULFUR, MOL. (S8)	14.46	25000	NJ NJ, t
9.		STRAIGHT-CHAIN ALKANE	19.06	200	J
10.		STRAIGHT-CHAIN ALKANE	19.60	270	J
11.		STRAIGHT-CHAIN ALKANE	20.12	230	J
12.		STRAIGHT-CHAIN ALKANE	21.09	180	J
13.		UNKNOWN	22.64	180	J
14.					
15.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-12RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U UJ/C
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-12RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	830	U
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	UR[illegible]
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	67	J
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	45	J
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-octylphthalate	410	U
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-12RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.41	420	JB
2.		UNKNOWN (BC)	5.70	1400	JB
3.		UNKNOWN (BC)	10.01	220	JB
4.		UNKNOWN	10.03	220	J
5.	10544-50-0	SULFUR, MOL. (S8)	14.22	7500	NJB
6.		UNKNOWN AMIDE	19.43	200	J
7.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-6B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-6B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	780	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	780	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	UJ,r
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	28	J
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	390	U
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-6B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.49	430	~~JB~~
2.		~~UNKNOWN (BC)~~	5.76	570	JB
3.					
4.					
5.					
6.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-8B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 32 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	480	U
108-95-2	Phenol	480	U
111-44-4	Bis(2-chloroethyl)ether	480	U
95-57-8	2-Chlorophenol	480	U
95-48-7	2-Methylphenol	480	U
108-60-1	2,2'-oxybis(1-Chloropropane)	480	U
98-86-2	Acetophenone	480	U
106-44-5	4-Methylphenol	480	U
621-64-7	N-Nitroso-di-N-propylamine	480	U
67-72-1	Hexachloroethane	480	U
98-95-3	Nitrobenzene	480	U
78-59-1	Isophorone	480	U
88-75-5	2-Nitrophenol	480	U
105-67-9	2,4-Dimethylphenol	480	U
111-91-1	Bis(2-chloroethoxy)methane	480	U
120-83-2	2,4-Dichlorophenol	480	U
91-20-3	Naphthalene	480	U
106-47-8	4-Chloroaniline	480	U
87-68-3	Hexachlorobutadiene	480	U
105-60-2	Caprolactam	480	U
59-50-7	4-Chloro-3-methylphenol	480	U
91-57-6	2-Methylnaphthalene	480	U
77-47-4	Hexachlorocyclopentadiene	480	U
88-06-2	2,4,6-Trichlorophenol	480	U
95-95-4	2,4,5-Trichlorophenol	480	U
92-52-4	1,1'-Biphenyl	480	U
91-58-7	2-Chloronaphthalene	480	U
88-74-4	2-Nitroaniline	960	U
131-11-3	Dimethylphthalate	480	U
606-20-2	2,6-Dinitrotoluene	480	U
208-96-8	Acenaphthylene	480	U
99-09-2	3-Nitroaniline	960	U
83-32-9	Acenaphthene	480	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-8B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 32 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2400	U
100-02-7	4-Nitrophenol	960	U
121-14-2	2,4-Dinitrotoluene	480	U
132-64-9	Dibenzofuran	480	U
84-66-2	Diethylphthalate	480	U
7005-72-3	4-Chlorophenyl-phenylether	480	U
86-73-7	Fluorene	480	U
100-01-6	4-Nitroaniline	960	U
534-52-1	4,6-Dinitro-2-methylphenol	960	U
86-30-6	N-Nitrosodiphenylamine (1)	960	U
101-55-3	4-Bromophenyl-phenylether	480	U
118-74-1	Hexachlorobenzene	480	U
1912-24-9	Atrazine	480	UUJ,r
87-86-5	Pentachlorophenol	480	U
85-01-8	Phenanthrene	480	U
120-12-7	Anthracene	480	U
86-74-8	Carbazole	480	U
84-74-2	Di-n-butylphthalate	480	U
206-44-0	Fluoranthene	480	U
129-00-0	Pyrene	480	U
85-68-7	Butylbenzylphthalate	480	U
91-94-1	3,3'-Dichlorobenzidine	480	U
117-81-7	bis(2-ethylhexyl)Phthalate	180	J
56-55-3	Benzo(a)anthracene	480	U
218-01-9	Chrysene	480	U
117-84-0	Di-n-octylphthalate	480	U
205-99-2	Benzo(b)fluoranthene	480	U
207-08-9	Benzo(k)fluoranthene	480	U
50-32-8	Benzo(a)pyrene	480	U
193-39-5	Indeno(1,2,3-cd)pyrene	480	U
53-70-3	Dibenzo(a,h)anthracene	480	U
191-24-2	Benzo(g,h,i)perylene	480	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-8B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 32 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	660	JB
2.		UNKNOWN (BC)	5.76	940	JB
3.		UNKNOWN (BC)	7.01	500	JB
4.		UNKNOWN (BC)	7.38	230	JB
5.		UNKNOWN (BC)	7.75	280	JB
6.		UNKNOWN	10.14	1200	J
7.		UNKNOWN	11.88	390	J
8.	10544-50-0	SULFUR, MOL. (S8)	14.38	7200	NJ NJ$_L$
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-9B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	470	U
108-95-2	Phenol	470	U
111-44-4	Bis(2-chloroethyl)ether	470	U
95-57-8	2-Chlorophenol	470	U
95-48-7	2-Methylphenol	470	U
108-60-1	2,2'-oxybis(1-Chloropropane)	470	U
98-86-2	Acetophenone	470	U
106-44-5	4-Methylphenol	470	U
621-64-7	N-Nitroso-di-N-propylamine	470	U
67-72-1	Hexachloroethane	470	U
98-95-3	Nitrobenzene	470	U
78-59-1	Isophorone	470	U
88-75-5	2-Nitrophenol	470	U
105-67-9	2,4-Dimethylphenol	470	U
111-91-1	Bis(2-chloroethoxy)methane	470	U
120-83-2	2,4-Dichlorophenol	470	U
91-20-3	Naphthalene	470	U
106-47-8	4-Chloroaniline	470	U
87-68-3	Hexachlorobutadiene	470	U
105-60-2	Caprolactam	470	U
59-50-7	4-Chloro-3-methylphenol	470	U
91-57-6	2-Methylnaphthalene	470	U
77-47-4	Hexachlorocyclopentadiene	470	U
88-06-2	2,4,6-Trichlorophenol	470	U
95-95-4	2,4,5-Trichlorophenol	470	U
92-52-4	1,1'-Biphenyl	470	U
91-58-7	2-Chloronaphthalene	470	U
88-74-4	2-Nitroaniline	940	U
131-11-3	Dimethylphthalate	470	U
606-20-2	2,6-Dinitrotoluene	470	U
208-96-8	Acenaphthylene	470	U
99-09-2	3-Nitroaniline	940	U
83-32-9	Acenaphthene	470	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-9B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2400	U
100-02-7	4-Nitrophenol	940	U
121-14-2	2,4-Dinitrotoluene	470	U
132-64-9	Dibenzofuran	470	U
84-66-2	Diethylphthalate	470	U
7005-72-3	4-Chlorophenyl-phenylether	470	U
86-73-7	Fluorene	470	U
100-01-6	4-Nitroaniline	940	U
534-52-1	4,6-Dinitro-2-methylphenol	940	U
86-30-6	N-Nitrosodiphenylamine (1)	940	U
101-55-3	4-Bromophenyl-phenylether	470	U
118-74-1	Hexachlorobenzene	470	U
1912-24-9	Atrazine	470	UJ,r
87-86-5	Pentachlorophenol	470	U
85-01-8	Phenanthrene	470	U
120-12-7	Anthracene	470	U
86-74-8	Carbazole	470	U
84-74-2	Di-n-butylphthalate	470	U
206-44-0	Fluoranthene	470	U
129-00-0	Pyrene	470	U
85-68-7	Butylbenzylphthalate	470	U
91-94-1	3,3'-Dichlorobenzidine	470	U
117-81-7	bis(2-ethylhexyl)Phthalate	470	U
56-55-3	Benzo(a)anthracene	470	U
218-01-9	Chrysene	470	U
117-84-0	Di-n-octylphthalate	470	U
205-99-2	Benzo(b)fluoranthene	470	U
207-08-9	Benzo(k)fluoranthene	470	U
50-32-8	Benzo(a)pyrene	470	U
193-39-5	Indeno(1,2,3-cd)pyrene	470	U
53-70-3	Dibenzo(a,h)anthracene	470	U
191-24-2	Benzo(g,h,i)perylene	470	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-9B64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.49	370	JB
2.		UNKNOWN (BC)	5.76	600	JB
3.		UNKNOWN (BC)	7.01	370	JB
4.		UNKNOWN (BC)	7.76	200	JB
5.		UNKNOWN	10.11	200	J
6.	10544-50-0	SULFUR, MOL. (S8)	14.36	1600	NJNJ, t
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-7RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	470	U
108-95-2	Phenol	470	U
111-44-4	Bis(2-chloroethyl)ether	470	U
95-57-8	2-Chlorophenol	470	U
95-48-7	2-Methylphenol	470	U
108-60-1	2,2'-oxybis(1-Chloropropane)	470	U
98-86-2	Acetophenone	470	U
106-44-5	4-Methylphenol	470	U
621-64-7	N-Nitroso-di-N-propylamine	470	U
67-72-1	Hexachloroethane	470	U
98-95-3	Nitrobenzene	470	U
78-59-1	Isophorone	470	U
88-75-5	2-Nitrophenol	470	U
105-67-9	2,4-Dimethylphenol	470	U
111-91-1	Bis(2-chloroethoxy)methane	470	U JC
120-83-2	2,4-Dichlorophenol	470	U
91-20-3	Naphthalene	470	U
106-47-8	4-Chloroaniline	470	U
87-68-3	Hexachlorobutadiene	470	U
105-60-2	Caprolactam	470	U
59-50-7	4-Chloro-3-methylphenol	470	U
91-57-6	2-Methylnaphthalene	470	U
77-47-4	Hexachlorocyclopentadiene	470	U
88-06-2	2,4,6-Trichlorophenol	470	U
95-95-4	2,4,5-Trichlorophenol	470	U
92-52-4	1,1'-Biphenyl	470	U
91-58-7	2-Chloronaphthalene	470	U
88-74-4	2-Nitroaniline	940	U
131-11-3	Dimethylphthalate	470	U
606-20-2	2,6-Dinitrotoluene	470	U
208-96-8	Acenaphthylene	470	U
99-09-2	3-Nitroaniline	940	U
83-32-9	Acenaphthene	470	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-7RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2400	U
100-02-7	4-Nitrophenol	940	U
121-14-2	2,4-Dinitrotoluene	470	U
132-64-9	Dibenzofuran	470	U
84-66-2	Diethylphthalate	470	U
7005-72-3	4-Chlorophenyl-phenylether	470	U
86-73-7	Fluorene	470	U
100-01-6	4-Nitroaniline	940	U
534-52-1	4,6-Dinitro-2-methylphenol	940	U
86-30-6	N-Nitrosodiphenylamine (1)	1400	J,R
101-55-3	4-Bromophenyl-phenylether	470	U
118-74-1	Hexachlorobenzene	470	U
1912-24-9	Atrazine	470	U R,C
87-86-5	Pentachlorophenol	470	U
85-01-8	Phenanthrene	34	J
120-12-7	Anthracene	470	U
86-74-8	Carbazole	470	U
84-74-2	Di-n-butylphthalate	100	J
206-44-0	Fluoranthene	470	U
129-00-0	Pyrene	470	U
85-68-7	Butylbenzylphthalate	470	U
91-94-1	3,3'-Dichlorobenzidine	470	U
117-81-7	bis(2-ethylhexyl)Phthalate	1800	
56-55-3	Benzo(a)anthracene	470	U
218-01-9	Chrysene	470	U
117-84-0	Di-n-octylphthalate	470	U
205-99-2	Benzo(b)fluoranthene	470	U
207-08-9	Benzo(k)fluoranthene	470	U
50-32-8	Benzo(a)pyrene	470	U
193-39-5	Indeno(1,2,3-cd)pyrene	470	U
53-70-3	Dibenzo(a,h)anthracene	470	U
191-24-2	Benzo(g,h,i)perylene	470	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-7RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.40	380	JB
2.		UNKNOWN (BC)	5.69	1300	JB
3.		UNKNOWN	10.02	310	J
4.		UNKNOWN	10.07	610	J
5.		UNKNOWN	10.11	620	J
6.		UNKNOWN	10.16	500	J
7.		UNKNOWN ALKANE	10.24	360	J
8.		UNKNOWN	10.29	310	J
9.		UNKNOWN	11.76	560	J
10.		UNKNOWN	12.41	490	J
11.	10544-50-0	SULFUR, MOL. (S8)	14.23	11000	NJB
12.		UNKNOWN	14.62	750	J
13.	90-30-2	1-NAPHTHALENAMINE, N-PHENYL-	15.08	410	NJ NJ =
14.		STRAIGHT-CHAIN ALKANE	18.34	410	J
15.		STRAIGHT-CHAIN ALKANE	18.92	570	J
16.		STRAIGHT-CHAIN ALKANE	20.49	400	J
17.		STRAIGHT-CHAIN ALKANE	20.97	320	J
18.		UNKNOWN	22.18	430	J
19.		UNKNOWN	22.24	270	J
20.	603-48-5	BENZENAMINE, 4,4',4''-METHYL	22.54	410	NJ NJ, t
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-5RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 23 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	430	U
108-95-2	Phenol	430	U
111-44-4	Bis(2-chloroethyl)ether	430	U
95-57-8	2-Chlorophenol	430	U
95-48-7	2-Methylphenol	430	U
108-60-1	2,2'-oxybis(1-Chloropropane)	430	U
98-86-2	Acetophenone	430	U
106-44-5	4-Methylphenol	430	U
621-64-7	N-Nitroso-di-N-propylamine	430	U
67-72-1	Hexachloroethane	430	U
98-95-3	Nitrobenzene	430	U
78-59-1	Isophorone	430	U
88-75-5	2-Nitrophenol	430	U
105-67-9	2,4-Dimethylphenol	430	U
111-91-1	Bis(2-chloroethoxy)methane	430	U JIC
120-83-2	2,4-Dichlorophenol	430	U
91-20-3	Naphthalene	430	U
106-47-8	4-Chloroaniline	430	U
87-68-3	Hexachlorobutadiene	430	U
105-60-2	Caprolactam	430	U
59-50-7	4-Chloro-3-methylphenol	430	U
91-57-6	2-Methylnaphthalene	33	J
77-47-4	Hexachlorocyclopentadiene	430	U
88-06-2	2,4,6-Trichlorophenol	430	U
95-95-4	2,4,5-Trichlorophenol	430	U
92-52-4	1,1'-Biphenyl	430	U
91-58-7	2-Chloronaphthalene	430	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	430	U
606-20-2	2,6-Dinitrotoluene	430	U
208-96-8	Acenaphthylene	430	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	430	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-5RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 23 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	860	U
121-14-2	2,4-Dinitrotoluene	430	U
132-64-9	Dibenzofuran	430	U
84-66-2	Diethylphthalate	430	U
7005-72-3	4-Chlorophenyl-phenylether	430	U
86-73-7	Fluorene	430	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	220	J JIV
101-55-3	4-Bromophenyl-phenylether	430	U
118-74-1	Hexachlorobenzene	430	U
1912-24-9	Atrazine	430	U R IC
87-86-5	Pentachlorophenol	430	U
85-01-8	Phenanthrene	83	J
120-12-7	Anthracene	430	U
86-74-8	Carbazole	430	U
84-74-2	Di-n-butylphthalate	67	J
206-44-0	Fluoranthene	52	J
129-00-0	Pyrene	66	J
85-68-7	Butylbenzylphthalate	430	U
91-94-1	3,3'-Dichlorobenzidine	430	U
117-81-7	bis(2-ethylhexyl)Phthalate	110	J
56-55-3	Benzo(a)anthracene	430	U
218-01-9	Chrysene	44	J
117-84-0	Di-n-octylphthalate	64	J
205-99-2	Benzo(b)fluoranthene	430	U
207-08-9	Benzo(k)fluoranthene	430	U
50-32-8	Benzo(a)pyrene	430	U
193-39-5	Indeno(1,2,3-cd)pyrene	430	U
53-70-3	Dibenzo(a,h)anthracene	430	U
191-24-2	Benzo(g,h,i)perylene	430	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-5RA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 23 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	480	JB
2.		UNKNOWN (BC)	5.69	1400	JB
3.	2245-38-7	NAPHTHALENE, 1,6,7-TRIMETHYL	10.01	330	NJ
4.		STRAIGHT-CHAIN ALKANE	10.24	170	J
5.		UNKNOWN ALKANE	10.79	170	J
6.		BRANCHED ALKANE	10.82	210	J
7.		UNKNOWN	11.72	440	J
8.	10544-50-0	SULFUR, MOL. (S8)	14.22	9600	NJB
9.		STRAIGHT-CHAIN ALKANE	18.92	190	J
10.		UNKNOWN	21.43	220	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-10RJA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 27 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	200	J
108-95-2	Phenol	450	U
111-44-4	Bis(2-chloroethyl)ether	450	U
95-57-8	2-Chlorophenol	450	U
95-48-7	2-Methylphenol	450	U
108-60-1	2,2'-oxybis(1-Chloropropane)	450	U
98-86-2	Acetophenone	60	J
106-44-5	4-Methylphenol	450	U
621-64-7	N-Nitroso-di-N-propylamine	450	U
67-72-1	Hexachloroethane	450	U
98-95-3	Nitrobenzene	450	U
78-59-1	Isophorone	450	U
88-75-5	2-Nitrophenol	450	U
105-67-9	2,4-Dimethylphenol	450	U
111-91-1	Bis(2-chloroethoxy)methane	450	UVJ,C
120-83-2	2,4-Dichlorophenol	450	U
91-20-3	Naphthalene	450	U
106-47-8	4-Chloroaniline	450	U
87-68-3	Hexachlorobutadiene	450	U
105-60-2	Caprolactam	450	U
59-50-7	4-Chloro-3-methylphenol	450	U
91-57-6	2-Methylnaphthalene	450	U
77-47-4	Hexachlorocyclopentadiene	450	U
88-06-2	2,4,6-Trichlorophenol	450	U
95-95-4	2,4,5-Trichlorophenol	450	U
92-52-4	1,1'-Biphenyl	450	U
91-58-7	2-Chloronaphthalene	450	U
88-74-4	2-Nitroaniline	910	U
131-11-3	Dimethylphthalate	450	U
606-20-2	2,6-Dinitrotoluene	450	U
208-96-8	Acenaphthylene	450	U
99-09-2	3-Nitroaniline	910	U
83-32-9	Acenaphthene	450	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-10RJA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 27 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2300	U
100-02-7	4-Nitrophenol	910	U
121-14-2	2,4-Dinitrotoluene	450	U
132-64-9	Dibenzofuran	450	U
84-66-2	Diethylphthalate	450	U
7005-72-3	4-Chlorophenyl-phenylether	450	U
86-73-7	Fluorene	450	U
100-01-6	4-Nitroaniline	910	U
534-52-1	4,6-Dinitro-2-methylphenol	910	U
86-30-6	N-Nitrosodiphenylamine (1)	1300	J,r
101-55-3	4-Bromophenyl-phenylether	450	U
118-74-1	Hexachlorobenzene	450	U
1912-24-9	Atrazine	450	U R,C
87-86-5	Pentachlorophenol	450	U
85-01-8	Phenanthrene	450	U
120-12-7	Anthracene	450	U
86-74-8	Carbazole	450	U
84-74-2	Di-n-butylphthalate	73	J
206-44-0	Fluoranthene	450	U
129-00-0	Pyrene	450	U
85-68-7	Butylbenzylphthalate	450	U
91-94-1	3,3'-Dichlorobenzidine	450	U
117-81-7	bis(2-ethylhexyl)Phthalate	2700	
56-55-3	Benzo(a)anthracene	450	U
218-01-9	Chrysene	450	U
117-84-0	Di-n-octylphthalate	450	U
205-99-2	Benzo(b)fluoranthene	450	U
207-08-9	Benzo(k)fluoranthene	450	U
50-32-8	Benzo(a)pyrene	450	U
193-39-5	Indeno(1,2,3-cd)pyrene	450	U
53-70-3	Dibenzo(a,h)anthracene	450	U
191-24-2	Benzo(g,h,i)perylene	450	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-10RJA64

Level: (low/med) LOW Date Received: 11/14/02

% Moisture: 27 decanted: (Y/N) N Date Extracted:11/23/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.40	420	JB
2.	98-82-8	BENZENE, (1-METHYLETHYL)-	5.47	460	NJ
3.		UNKNOWN (BC)	5.69	1500	JB
4.		UNKNOWN (BC)	10.06	710	JB
5.		UNKNOWN	11.07	1100	J
6.	7694-30-6	BENZENE, 1,1'-(1,2-CYCLOBUTA	11.29	3000	NJ
7.		UNKNOWN	12.41	480	J
8.	10544-50-0	SULFUR, MOL. (S8)	14.22	8700	NJB
9.		UNKNOWN	14.62	500	J
10.		UNKNOWN	17.52	3700	J
11.		UNKNOWN	18.18	3900	J
12.		UNKNOWN	18.26	6200	J
13.		UNKNOWN	18.31	1900	J
14.		UNKNOWN	18.36	2400	J
15.		UNKNOWN	18.90	900	J
16.		STRAIGHT-CHAIN ALKANE	18.94	560	J
17.		UNKNOWN	19.02	630	J
18.		UNKNOWN ALKANE	19.14	430	J
19.	603-48-5	BENZENAMINE, 4,4',4''-METHYL	22.54	600	NJ
20.		UNKNOWN	24.79	1200	J
21.					
22.					
23.					
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25.					
26.					
27.					
28.					
29.					
30.					

FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-14J2A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 32 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	490	U
108-95-2	Phenol	99	J J,l
111-44-4	Bis(2-chloroethyl)ether	490	U
95-57-8	2-Chlorophenol	490	U
95-48-7	2-Methylphenol	490	U
108-60-1	2,2'-oxybis(1-Chloropropane)	490	U
98-86-2	Acetophenone	490	U
106-44-5	4-Methylphenol	160	J J,r
621-64-7	N-Nitroso-di-N-propylamine	490	U
67-72-1	Hexachloroethane	490	U
98-95-3	Nitrobenzene	490	U
78-59-1	Isophorone	490	U
88-75-5	2-Nitrophenol	490	U
105-67-9	2,4-Dimethylphenol	490	U
111-91-1	Bis(2-chloroethoxy)methane	490	U
120-83-2	2,4-Dichlorophenol	490	U
91-20-3	Naphthalene	460	J J,r
106-47-8	4-Chloroaniline	490	U
87-68-3	Hexachlorobutadiene	490	U
105-60-2	Caprolactam	490	U
59-50-7	4-Chloro-3-methylphenol	490	U
91-57-6	2-Methylnaphthalene	1000	J,r
77-47-4	Hexachlorocyclopentadiene	490	U
88-06-2	2,4,6-Trichlorophenol	490	U
95-95-4	2,4,5-Trichlorophenol	490	U
92-52-4	1,1'-Biphenyl	94	J
91-58-7	2-Chloronaphthalene	490	U
88-74-4	2-Nitroaniline	970	U
131-11-3	Dimethylphthalate	490	U
606-20-2	2,6-Dinitrotoluene	490	U
208-96-8	Acenaphthylene	490	U
99-09-2	3-Nitroaniline	970	U
83-32-9	Acenaphthene	490	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-14J2A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 32 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2400	U
100-02-7	4-Nitrophenol	970	U
121-14-2	2,4-Dinitrotoluene	490	U
132-64-9	Dibenzofuran	490	U
84-66-2	Diethylphthalate	140	J
7005-72-3	4-Chlorophenyl-phenylether	490	U
86-73-7	Fluorene	100	J J,r
100-01-6	4-Nitroaniline	970	U
534-52-1	4,6-Dinitro-2-methylphenol	970	U
86-30-6	N-Nitrosodiphenylamine (1)	1700	J,r
101-55-3	4-Bromophenyl-phenylether	490	U
118-74-1	Hexachlorobenzene	490	U
1912-24-9	Atrazine	490	U J,c
87-86-5	Pentachlorophenol	490	U
85-01-8	Phenanthrene	260	J J,r
120-12-7	Anthracene	490	U
86-74-8	Carbazole	490	U
84-74-2	Di-n-butylphthalate	420	J
206-44-0	Fluoranthene	120	J
129-00-0	Pyrene	130	J
85-68-7	Butylbenzylphthalate	220	J
91-94-1	3,3'-Dichlorobenzidine	490	U
117-81-7	bis(2-ethylhexyl)Phthalate	5700	J,r
56-55-3	Benzo(a)anthracene	51	J
218-01-9	Chrysene	79	J J,r
117-84-0	Di-n-octylphthalate	2000	
205-99-2	Benzo(b)fluoranthene	58	J
207-08-9	Benzo(k)fluoranthene	490	U
50-32-8	Benzo(a)pyrene	490	U
193-39-5	Indeno(1,2,3-cd)pyrene	490	U
53-70-3	Dibenzo(a,h)anthracene	490	U
191-24-2	Benzo(g,h,i)perylene	37	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-14J2A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 32 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	527-84-4	BENZENE, 1-METHYL-2-(1-METHY	6.59	3000	NJ
2.	5989-54-8	CYCLOHEXENE, 1-METHYL-4-(1-M	6.62	2400	NJ
3.		CYCLIC ALKANE	7.48	2200	J
4.		UNKNOWN ALKANE	7.60	1600	J
5.		UNKNOWN	9.50	3600	J
6.		BRANCHED ALKANE	9.56	2000	J
7.		UNKNOWN	9.67	1700	J
8.		BRANCHED ALKANE	10.92	2300	J
9.		UNKNOWN	11.02	3000	J
10.	10544-50-0	SULFUR, MOL. (S8)	14.42	19000	NJ
11.		UNKNOWN	14.81	3000	J
12.	57-11-4	OCTADECANOIC ACID	15.25	6600	NJ
13.	80-05-7	PHENOL, 4,4'-(1-METHYLETHYLI	15.50	3300	NJ
14.		UNKNOWN PAH	15.94	9200	J
15.		UNKNOWN	17.63	2100	J
16.	73105-67-6	1-IODO-2-METHYLUNDECANE	18.46	3600	NJ
17.		STRAIGHT-CHAIN ALKANE	19.05	2600	J
18.		STRAIGHT-CHAIN ALKANE	19.60	3300	J
19.		BRANCHED ALKANE	20.12	3300	J
20.	119-07-3	1,2-BENZENEDICARBOXYLIC ACID	20.36	3500	NJ
21.					
22.					
23.					
24.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-17A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 31 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	480	U
108-95-2	Phenol	480	U
111-44-4	Bis(2-chloroethyl)ether	480	U
95-57-8	2-Chlorophenol	480	U
95-48-7	2-Methylphenol	480	U
108-60-1	2,2'-oxybis(1-Chloropropane)	480	U
98-86-2	Acetophenone	480	U
106-44-5	4-Methylphenol	480	U
621-64-7	N-Nitroso-di-N-propylamine	480	U
67-72-1	Hexachloroethane	480	U
98-95-3	Nitrobenzene	480	U
78-59-1	Isophorone	480	U
88-75-5	2-Nitrophenol	480	U
105-67-9	2,4-Dimethylphenol	480	U
111-91-1	Bis(2-chloroethoxy)methane	480	U
120-83-2	2,4-Dichlorophenol	480	U
91-20-3	Naphthalene	480	U
106-47-8	4-Chloroaniline	480	U
87-68-3	Hexachlorobutadiene	480	U
105-60-2	Caprolactam	480	U
59-50-7	4-Chloro-3-methylphenol	480	U
91-57-6	2-Methylnaphthalene	480	U
77-47-4	Hexachlorocyclopentadiene	480	U
88-06-2	2,4,6-Trichlorophenol	480	U
95-95-4	2,4,5-Trichlorophenol	480	U
92-52-4	1,1'-Biphenyl	480	U
91-58-7	2-Chloronaphthalene	480	U
88-74-4	2-Nitroaniline	950	U
131-11-3	Dimethylphthalate	480	U
606-20-2	2,6-Dinitrotoluene	480	U
208-96-8	Acenaphthylene	480	U
99-09-2	3-Nitroaniline	950	U
83-32-9	Acenaphthene	480	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-17A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 31 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2400	U
100-02-7	4-Nitrophenol	950	U
121-14-2	2,4-Dinitrotoluene	480	U
132-64-9	Dibenzofuran	480	U
84-66-2	Diethylphthalate	480	U
7005-72-3	4-Chlorophenyl-phenylether	480	U
86-73-7	Fluorene	480	U
100-01-6	4-Nitroaniline	950	U
534-52-1	4,6-Dinitro-2-methylphenol	950	U
86-30-6	N-Nitrosodiphenylamine (1)	950	U
101-55-3	4-Bromophenyl-phenylether	480	U
118-74-1	Hexachlorobenzene	480	U
1912-24-9	Atrazine	480	U UJ; R
87-86-5	Pentachlorophenol	480	U
85-01-8	Phenanthrene	480	U
120-12-7	Anthracene	480	U
86-74-8	Carbazole	480	U
84-74-2	Di-n-butylphthalate	480	U
206-44-0	Fluoranthene	480	U
129-00-0	Pyrene	480	U
85-68-7	Butylbenzylphthalate	480	U
91-94-1	3,3'-Dichlorobenzidine	480	U
117-81-7	bis(2-ethylhexyl)Phthalate	86	J
56-55-3	Benzo(a)anthracene	480	U
218-01-9	Chrysene	480	U
117-84-0	Di-n-octylphthalate	210	J
205-99-2	Benzo(b)fluoranthene	480	U
207-08-9	Benzo(k)fluoranthene	480	U
50-32-8	Benzo(a)pyrene	480	U
193-39-5	Indeno(1,2,3-cd)pyrene	480	U
53-70-3	Dibenzo(a,h)anthracene	480	U
191-24-2	Benzo(g,h,i)perylene	480	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2788-17A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 31 decanted: (Y/N) N Date Extracted:11/18/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.48	880	JB
2.		UNKNOWN (BC)	5.76	1500	JB
3.		UNKNOWN	19.33	260	J
4.		UNKNOWN	19.48	370	J
5.		UNKNOWN	19.62	390	J
6.		UNKNOWN	19.80	290	J
7.		UNKNOWN	19.85	400	J
8.		UNKNOWN	19.91	330	J
9.		UNKNOWN CARBOXYLIC ACID	19.94	260	J
10.		UNKNOWN	19.99	310	J
11.					
12.					
13.					
14.					
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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.98	U
319-84-6	alpha-BHC	0.98	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	0.98	U
58-89-9	gamma-BHC (Lindane)	0.98	U
72-54-8	4,4'-DDD	3.9	U
72-55-9	4,4'-DDE	1.8	JP J, 9
50-29-3	4,4'-DDT	5.9	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
72-20-8	Endrin	3.9	U
7421-93-4	Endrin Aldehyde	3.9	U
76-44-8	Heptachlor	0.98	U
1024-57-3	Heptachlor Epoxide	0.98	U
72-43-5	Methoxychlor	9.8	U
8001-35-2	Toxaphene	98	U
12674-11-2	Aroclor-1016	76	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	76	U
53469-21-9	Aroclor-1242	53	U
12672-29-6	Aroclor-1248	53	U
11097-69-1	Aroclor-1254	130	
11096-82-5	Aroclor-1260	45	J
53494-70-5	Endrin Ketone	9.8	U
5103-74-2	gamma-Chlordane	0.98	U
5103-71-9	alpha-Chlordane	3.2	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 22 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/28/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.1	U
319-84-6	alpha-BHC	1.1	U
319-85-7	beta-BHC	2.2	U
319-86-8	delta-BHC	1.1	U
58-89-9	gamma-BHC (Lindane)	1.1	U
72-54-8	4,4'-DDD	4.2	U
72-55-9	4,4'-DDE	2.2	U
50-29-3	4,4'-DDT	6.4	U
60-57-1	Dieldrin	2.2	U
959-98-8	Endosulfan I	2.2	U
33213-65-9	Endosulfan II	4.2	U
1031-07-8	Endosulfan sulfate	4.2	U
72-20-8	Endrin	4.2	U
7421-93-4	Endrin Aldehyde	4.2	U
76-44-8	Heptachlor	1.1	U
1024-57-3	Heptachlor Epoxide	1.1	U
72-43-5	Methoxychlor	11	U
8001-35-2	Toxaphene	110	U
12674-11-2	Aroclor-1016	83	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	83	U
53469-21-9	Aroclor-1242	58	U
12672-29-6	Aroclor-1248	58	U
11097-69-1	Aroclor-1254	58	U
11096-82-5	Aroclor-1260	83	U
53494-70-5	Endrin Ketone	11	U
5103-74-2	gamma-Chlordane	0.70	J
5103-71-9	alpha-Chlordane	1.4	JP

J, 7

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 37 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/28/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.3	U
319-84-6	alpha-BHC	1.3	U
319-85-7	beta-BHC	2.7	U
319-86-8	delta-BHC	1.3	U
58-89-9	gamma-BHC (Lindane)	1.3	U
72-54-8	4,4'-DDD	5.2	U
72-55-9	4,4'-DDE	2.7	U
50-29-3	4,4'-DDT	7.9	U
60-57-1	Dieldrin	2.7	U
959-98-8	Endosulfan I	2.7	U
33213-65-9	Endosulfan II	5.2	U
1031-07-8	Endosulfan sulfate	5.2	U
72-20-8	Endrin	5.2	U
7421-93-4	Endrin Aldehyde	5.2	U
76-44-8	Heptachlor	1.3	U
1024-57-3	Heptachlor Epoxide	1.3	U
72-43-5	Methoxychlor	13	U
8001-35-2	Toxaphene	130	U
12674-11-2	Aroclor-1016	100	U
11104-28-2	Aroclor-1221	130	U
11141-16-5	Aroclor-1232	100	U
53469-21-9	Aroclor-1242	71	U
12672-29-6	Aroclor-1248	71	U
11097-69-1	Aroclor-1254	71	U
11096-82-5	Aroclor-1260	100	U
53494-70-5	Endrin Ketone	13	U
5103-74-2	gamma-Chlordane	1.3	U
5103-71-9	alpha-Chlordane	2.7	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.1	U
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.1	U
50-29-3	4,4'-DDT	6.1	U
60-57-1	Dieldrin	2.1	U
959-98-8	Endosulfan I	2.1	U
33213-65-9	Endosulfan II	4.0	U
1031-07-8	Endosulfan sulfate	4.0	U
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	1.0	U
72-43-5	Methoxychlor	10	U
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	79	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	79	U
53469-21-9	Aroclor-1242	55	U
12672-29-6	Aroclor-1248	55	U
11097-69-1	Aroclor-1254	20	J
11096-82-5	Aroclor-1260	18	J
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	0.49	J

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.98	U
319-84-6	alpha-BHC	0.98	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	0.98	U
58-89-9	gamma-BHC (Lindane)	0.98	U
72-54-8	4,4'-DDD	3.9	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	5.9	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
72-20-8	Endrin	3.9	U
7421-93-4	Endrin Aldehyde	3.9	U
76-44-8	Heptachlor	0.98	U
1024-57-3	Heptachlor Epoxide	0.98	U
72-43-5	Methoxychlor	9.8	U
8001-35-2	Toxaphene	98	U
12674-11-2	Aroclor-1016	76	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	76	U
53469-21-9	Aroclor-1242	53	U
12672-29-6	Aroclor-1248	53	U
11097-69-1	Aroclor-1254	310	
11096-82-5	Aroclor-1260	47	J
53494-70-5	Endrin Ketone	9.8	U
5103-74-2	gamma-Chlordane	0.98	U
5103-71-9	alpha-Chlordane	2.0	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 29 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	46	U
11104-28-2	Aroclor-1221	60	U
11141-16-5	Aroclor-1232	46	U
53469-21-9	Aroclor-1242	32	U
12672-29-6	Aroclor-1248	32	U
11097-69-1	Aroclor-1254	32	U
11096-82-5	Aroclor-1260	46	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 32 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	48	U
11104-28-2	Aroclor-1221	63	U
11141-16-5	Aroclor-1232	48	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	48	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	40	U
11104-28-2	Aroclor-1221	52	U
11141-16-5	Aroclor-1232	40	U
53469-21-9	Aroclor-1242	27	U
12672-29-6	Aroclor-1248	27	U
11097-69-1	Aroclor-1254	27	U
11096-82-5	Aroclor-1260	40	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 31 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	47	U
11104-28-2	Aroclor-1221	62	U
11141-16-5	Aroclor-1232	47	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	47	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 26 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	44	U
11104-28-2	Aroclor-1221	57	U
11141-16-5	Aroclor-1232	44	U
53469-21-9	Aroclor-1242	30	U
12672-29-6	Aroclor-1248	30	U
11097-69-1	Aroclor-1254	30	U
11096-82-5	Aroclor-1260	44	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 33 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	63	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	49	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 26 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	44	U
11104-28-2	Aroclor-1221	57	U
11141-16-5	Aroclor-1232	44	U
53469-21-9	Aroclor-1242	30	U
12672-29-6	Aroclor-1248	30	U
11097-69-1	Aroclor-1254	30	U
11096-82-5	Aroclor-1260	44	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	81	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	81	U
53469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	74	
11096-82-5	Aroclor-1260	71	JP

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	76	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	76	U
53469-21-9	Aroclor-1242	53	U
12672-29-6	Aroclor-1248	53	U
11097-69-1	Aroclor-1254	90	P JIG
11096-82-5	Aroclor-1260	76	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 31 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	47	U
11104-28-2	Aroclor-1221	62	U
11141-16-5	Aroclor-1232	47	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	47	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 30 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	46	U
11104-28-2	Aroclor-1221	61	U
11141-16-5	Aroclor-1232	46	U
53469-21-9	Aroclor-1242	32	U
12672-29-6	Aroclor-1248	32	U
11097-69-1	Aroclor-1254	32	U
11096-82-5	Aroclor-1260	46	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 30 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	460	U
11104-28-2	Aroclor-1221	610	U
11141-16-5	Aroclor-1232	460	U
53469-21-9	Aroclor-1242	320	U
12672-29-6	Aroclor-1248	320	U
11097-69-1	Aroclor-1254	450	
11096-82-5	Aroclor-1260	460	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 23 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	210	U
11104-28-2	Aroclor-1221	280	U
11141-16-5	Aroclor-1232	210	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	270	P JIG
11096-82-5	Aroclor-1260	210	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-2

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 27 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/04/02

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	89	U
11104-28-2	Aroclor-1221	120	U
11141-16-5	Aroclor-1232	89	U
53469-21-9	Aroclor-1242	62	U
12672-29-6	Aroclor-1248	62	U
11097-69-1	Aroclor-1254	170	P J,a
11096-82-5	Aroclor-1260	89	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-3

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14.REJ

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 32 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	48	U
11104-28-2	Aroclor-1221	63	U
11141-16-5	Aroclor-1232	48	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
~~11097-69-1~~	~~Aroclor-1254~~	~~780~~	~~E J~~ C
11096-82-5	Aroclor-1260	300	

Do Not use EA 2/24/05

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-3

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 32 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/18/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/22/02

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	240	U
11104-28-2	Aroclor-1221	310	U
11141-16-5	Aroclor-1232	240	U
53469-21-9	Aroclor-1242	170	U
12672-29-6	Aroclor-1248	~~170~~	~~U~~
11097-69-1	Aroclor-1254	1700	DPJ
11096-82-5	Aroclor-1260	410	DPJ

Use only this result For this sample

RA

2/24/03

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-4

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 31 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/19/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	47	U
11104-28-2	Aroclor-1221	62	U
11141-16-5	Aroclor-1232	47	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	47	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	26	J J,d
83-32-9	Acenaphthene	49	U UL,S
86-73-7	Fluorene	49	U ↓
129-00-0	Pyrene	41	P J,C
85-01-8	Phenanthrene	24	J L,S
120-12-7	Anthracene	49	U UL,S
206-44-0	Fluoranthene	58	L,S
218-01-9	Chrysene	94	P ↓
205-99-2	Benzo(b)fluoranthene	18	J,C
207-08-9	Benzo(k)fluoranthene	18	L,S
53-70-3	Dibenzo(a,h)anthracene	9.8	U UL,S
191-24-2	Benzo(g,h,i)perylene	10	JP L,S
56-55-3	Benzo(a)anthracene	11	
50-32-8	Benzo(a)pyrene	19	P ↓
193-39-5	Indeno(1,2,3-cd)pyrene	11	
208-96-8	Acenaphthylene	49	U UL,S

ANALYTICAL DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 29 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
91-20-3	Naphthalene	59	U	
83-32-9	Acenaphthene	1500	PZ	J,C
86-73-7	Fluorene	59	U	
129-00-0	Pyrene	24	U	
85-01-8	Phenanthrene	59	U	
120-12-7	Anthracene	59	U	
206-44-0	Fluoranthene	24	U	
218-01-9	Chrysene	12	U	
205-99-2	Benzo(b)fluoranthene	18	P	J,C
207-08-9	Benzo(k)fluoranthene	12	U	
53-70-3	Dibenzo(a,h)anthracene	12	U	
191-24-2	Benzo(g,h,i)perylene	12	U	
56-55-3	Benzo(a)anthracene	12	U	
50-32-8	Benzo(a)pyrene	35	P	J,g
193-39-5	Indeno(1,2,3-cd)pyrene	12	U	
208-96-8	Acenaphthylene	59	U	

Z (Results reported with a two fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 32 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	62	U
83-32-9	Acenaphthene	62	U
86-73-7	Fluorene	62	U
129-00-0	Pyrene	25	U
85-01-8	Phenanthrene	62	U
120-12-7	Anthracene	62	U
206-44-0	Fluoranthene	25	U
218-01-9	Chrysene	12	U
205-99-2	Benzo(b)fluoranthene	12	U UJ,C
207-08-9	Benzo(k)fluoranthene	12	U
53-70-3	Dibenzo(a,h)anthracene	12	U
191-24-2	Benzo(g,h,i)perylene	12	U
56-55-3	Benzo(a)anthracene	12	U
50-32-8	Benzo(a)pyrene	12	U
193-39-5	Indeno(1,2,3-cd)pyrene	12	U
208-96-8	Acenaphthylene	62	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	51	P UJ, C
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	25	
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U UJ, C
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 22 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	54	U
83-32-9	Acenaphthene	47	J J, C
86-73-7	Fluorene	54	U
129-00-0	Pyrene	35	B B, Z
85-01-8	Phenanthrene	22	J
120-12-7	Anthracene	54	U
206-44-0	Fluoranthene	67	
218-01-9	Chrysene	11	U
205-99-2	Benzo(b)fluoranthene	63	BP J, g
207-08-9	Benzo(k)fluoranthene	53	P ↓
53-70-3	Dibenzo(a,h)anthracene	44	
191-24-2	Benzo(g,h,i)perylene	24	P J, g
56-55-3	Benzo(a)anthracene	29	
50-32-8	Benzo(a)pyrene	41	P J, g
193-39-5	Indeno(1,2,3-cd)pyrene	48	
208-96-8	Acenaphthylene	54	U

FORM I PEST

[illegible] DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 37 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	67	U
83-32-9	Acenaphthene	17	J J, c
86-73-7	Fluorene	67	U
129-00-0	Pyrene	27	U
85-01-8	Phenanthrene	67	U
120-12-7	Anthracene	67	U
206-44-0	Fluoranthene	27	U
218-01-9	Chrysene	13	U
205-99-2	Benzo(b)fluoranthene	13	U
207-08-9	Benzo(k)fluoranthene	13	U
53-70-3	Dibenzo(a,h)anthracene	13	U
191-24-2	Benzo(g,h,i)perylene	13	U
56-55-3	Benzo(a)anthracene	13	U
50-32-8	Benzo(a)pyrene	13	U
193-39-5	Indeno(1,2,3-cd)pyrene	13	U
208-96-8	Acenaphthylene	67	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 31 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	61	U
83-32-9	Acenaphthene	61	U
86-73-7	Fluorene	61	U
129-00-0	Pyrene	14	JB B, Z
85-01-8	Phenanthrene	61	U
120-12-7	Anthracene	61	U
206-44-0	Fluoranthene	25	U
218-01-9	Chrysene	12	U
205-99-2	Benzo(b)fluoranthene	12	U
207-08-9	Benzo(k)fluoranthene	12	U
53-70-3	Dibenzo(a,h)anthracene	12	U
191-24-2	Benzo(g,h,i)perylene	12	U
56-55-3	Benzo(a)anthracene	12	U
50-32-8	Benzo(a)pyrene	12	U
193-39-5	Indeno(1,2,3-cd)pyrene	12	U
208-96-8	Acenaphthylene	61	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 26 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	57	U
83-32-9	Acenaphthene	57	U
86-73-7	Fluorene	57	U
129-00-0	Pyrene	23	U
85-01-8	Phenanthrene	57	U
120-12-7	Anthracene	57	U
206-44-0	Fluoranthene	21	BJPJ,g
218-01-9	Chrysene	11	U
205-99-2	Benzo(b)fluoranthene	8.4	BJPB,e
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	16	P
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	57	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 33 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	63	U
83-32-9	Acenaphthene	15	BJ J, C
86-73-7	Fluorene	63	U
129-00-0	Pyrene	14	JB B, Z
85-01-8	Phenanthrene	63	U
120-12-7	Anthracene	63	U
206-44-0	Fluoranthene	25	U
218-01-9	Chrysene	12	U
205-99-2	Benzo(b)fluoranthene	13	BP B, Z
207-08-9	Benzo(k)fluoranthene	12	U
53-70-3	Dibenzo(a,h)anthracene	12	U
191-24-2	Benzo(g,h,i)perylene	12	U
56-55-3	Benzo(a)anthracene	12	U
50-32-8	Benzo(a)pyrene	12	U
193-39-5	Indeno(1,2,3-cd)pyrene	12	U
208-96-8	Acenaphthylene	63	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	33	J J,d
83-32-9	Acenaphthene	21	J J,c
86-73-7	Fluorene	51	U
129-00-0	Pyrene	17	JP J,g
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	26	P J,g
218-01-9	Chrysene	5.2	J
205-99-2	Benzo(b)fluoranthene	5.4	JP J,g
207-08-9	Benzo(k)fluoranthene	10	JP J,d
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	6.9	J
208-96-8	Acenaphthylene	51	U

FORM I PEST

DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 26 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	57	U
83-32-9	Acenaphthene	55	JP J,C
86-73-7	Fluorene	57	U
129-00-0	Pyrene	23	U
85-01-8	Phenanthrene	57	U
120-12-7	Anthracene	57	U
206-44-0	Fluoranthene	22	JP J,g
218-01-9	Chrysene	11	U
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	65	P J,d
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	16	P J,g
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	57	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	52	U
83-32-9	Acenaphthene	52	U
86-73-7	Fluorene	52	U
129-00-0	Pyrene	750	PZ J,g
85-01-8	Phenanthrene	500	K,S
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	770	E J,g
218-01-9	Chrysene	2500	PZ J,g
205-99-2	Benzo(b)fluoranthene	170	K,S
207-08-9	Benzo(k)fluoranthene	200	P J,g
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	92	JPZ J,g
56-55-3	Benzo(a)anthracene	230	Z K,S
50-32-8	Benzo(a)pyrene	170	↓
193-39-5	Indeno(1,2,3-cd)pyrene	120	↓
208-96-8	Acenaphthylene	52	U

Z (Results reported with a twenty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U UL/S
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	9.6	J L/S
218-01-9	Chrysene	9.8	U UL/S
205-99-2	Benzo(b)fluoranthene	2.5	J J/C
207-08-9	Benzo(k)fluoranthene	4.0	J J/C
53-70-3	Dibenzo(a,h)anthracene	9.8	U UL/S
191-24-2	Benzo(g,h,i)perylene	9.8	U
56-55-3	Benzo(a)anthracene	3.1	J L/S
50-32-8	Benzo(a)pyrene	9.8	U UL/S
193-39-5	Indeno(1,2,3-cd)pyrene	9.8	U
208-96-8	Acenaphthylene	49	U

FORM I PEST

DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7ARE

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/09/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	68	
85-01-8	Phenanthrene	55	
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	130	P J,g
218-01-9	Chrysene	210	P ↓
205-99-2	Benzo(b)fluoranthene	42	P
207-08-9	Benzo(k)fluoranthene	53	P J,d
53-70-3	Dibenzo(a,h)anthracene	19	P J,g
191-24-2	Benzo(g,h,i)perylene	51	P ↓
56-55-3	Benzo(a)anthracene	27	
50-32-8	Benzo(a)pyrene	31	
193-39-5	Indeno(1,2,3-cd)pyrene	14	P J,g
208-96-8	Acenaphthylene	49	U

ANALYTICAL DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 31 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	610	U
83-32-9	Acenaphthene	610	U
86-73-7	Fluorene	610	U
129-00-0	Pyrene	90	JP J,q
85-01-8	Phenanthrene	610	U
120-12-7	Anthracene	610	U
206-44-0	Fluoranthene	250	U
218-01-9	Chrysene	1800	P J,q
205-99-2	Benzo(b)fluoranthene	120	U UJ,c
207-08-9	Benzo(k)fluoranthene	120	U
53-70-3	Dibenzo(a,h)anthracene	120	U
191-24-2	Benzo(g,h,i)perylene	120	U
56-55-3	Benzo(a)anthracene	120	U
50-32-8	Benzo(a)pyrene	120	U
193-39-5	Indeno(1,2,3-cd)pyrene	120	U
208-96-8	Acenaphthylene	610	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 30 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	60	U
83-32-9	Acenaphthene	60	U
86-73-7	Fluorene	60	U
129-00-0	Pyrene	24	U
85-01-8	Phenanthrene	60	U
120-12-7	Anthracene	60	U
206-44-0	Fluoranthene	24	U
218-01-9	Chrysene	12	U
205-99-2	Benzo(b)fluoranthene	12	U UJ/C
207-08-9	Benzo(k)fluoranthene	12	U
53-70-3	Dibenzo(a,h)anthracene	12	U
191-24-2	Benzo(g,h,i)perylene	12	U
56-55-3	Benzo(a)anthracene	12	U
50-32-8	Benzo(a)pyrene	12	U
193-39-5	Indeno(1,2,3-cd)pyrene	12	U
208-96-8	Acenaphthylene	60	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 30 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	5500	PZ J,d
83-32-9	Acenaphthene	9100	EP J,c
86-73-7	Fluorene	60	U
129-00-0	Pyrene	190	PZ K,S
85-01-8	Phenanthrene	190	P ↓
120-12-7	Anthracene	60	U
206-44-0	Fluoranthene	310	P K,S
218-01-9	Chrysene	25	JPZ ↓
205-99-2	Benzo(b)fluoranthene	280	EP J,c
207-08-9	Benzo(k)fluoranthene	59	U
53-70-3	Dibenzo(a,h)anthracene	59	U
191-24-2	Benzo(g,h,i)perylene	59	U
56-55-3	Benzo(a)anthracene	30C	PZ K,S
50-32-8	Benzo(a)pyrene	59	U
193-39-5	Indeno(1,2,3-cd)pyrene	59	U
208-96-8	Acenaphthylene	300	U

Z (Results reported from five fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 23 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	1300	E J,d
83-32-9	Acenaphthene	1200	PZ J,d
86-73-7	Fluorene	160	JPZ K,S
129-00-0	Pyrene	1100	PZ
85-01-8	Phenanthrene	1100	Z
120-12-7	Anthracene	130	JPZ
206-44-0	Fluoranthene	3200	EP
218-01-9	Chrysene	640	PZ
205-99-2	Benzo(b)fluoranthene	460	Z J,C
207-08-9	Benzo(k)fluoranthene	570	EP
53-70-3	Dibenzo(a,h)anthracene	160	PZ
191-24-2	Benzo(g,h,i)perylene	250	PZ K,S
56-55-3	Benzo(a)anthracene	540	PZ
50-32-8	Benzo(a)pyrene	380	Z
193-39-5	Indeno(1,2,3-cd)pyrene	3600	EBP
208-96-8	Acenaphthylene	210	JPZ

Z (Results reported with a five fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-2

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 27 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	690	JPZ J, d
83-32-9	Acenaphthene	58	U
86-73-7	Fluorene	58	U
129-00-0	Pyrene	310	K,S
85-01-8	Phenanthrene	58	U
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	23	U
218-01-9	Chrysene	2400	PZ J,g
205-99-2	Benzo(b)fluoranthene	86	JZ K,S
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	140	JPZ J,g
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	58	U

Z (Results reported with a twenty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-3

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 32 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/18/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	62	U
83-32-9	Acenaphthene	1900	PZ J,C
86-73-7	Fluorene	62	U
129-00-0	Pyrene	810	BE K,S
85-01-8	Phenanthrene	780	↓
120-12-7	Anthracene	62	U
206-44-0	Fluoranthene	2400	BEP J, g
218-01-9	Chrysene	470	Z K,S
205-99-2	Benzo(b)fluoranthene	850	BEP J,g
207-08-9	Benzo(k)fluoranthene	1000	EP ↓
53-70-3	Dibenzo(a,h)anthracene	12	U
191-24-2	Benzo(g,h,i)perylene	12	U
56-55-3	Benzo(a)anthracene	3800	PZ J,g
50-32-8	Benzo(a)pyrene	900	BEP ↓
193-39-5	Indeno(1,2,3-cd)pyrene	650	BEP
208-96-8	Acenaphthylene	62	U

Z (Results reported with a twenty-five fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-4

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 31 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/18/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	61	U
83-32-9	Acenaphthene	740	P J,C
86-73-7	Fluorene	61	U
129-00-0	Pyrene	28	BP B,Z
85-01-8	Phenanthrene	61	U
120-12-7	Anthracene	61	U
206-44-0	Fluoranthene	25	U
218-01-9	Chrysene	12	U
205-99-2	Benzo(b)fluoranthene	24	BP B,Z
207-08-9	Benzo(k)fluoranthene	12	U
53-70-3	Dibenzo(a,h)anthracene	12	U
191-24-2	Benzo(g,h,i)perylene	12	U
56-55-3	Benzo(a)anthracene	12	U
50-32-8	Benzo(a)pyrene	2.9	J
193-39-5	Indeno(1,2,3-cd)pyrene	12	U
208-96-8	Acenaphthylene	61	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ.C
479-45-8	Tetryl	2.0	U	
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

UJ, C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

UJ, C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

UJ, C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ, C
479-45-8	Tetryl	2.0	U	
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U UJ, M
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U UJ, C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

UJ, C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

UJ, c

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ, C
479-45-8	Tetryl	2.0	U	
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ, C
479-45-8	Tetryl	2.0	U	UJ, C
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ,C
479-45-8	Tetryl	2.0	U	UJ,C
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

40SB6F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ, C
479-45-8	Tetryl	2.0	U	UJ, C
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ, C
479-45-8	Tetryl	2.0	U	UJ, C
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ,C
479-45-8	Tetryl	2.0	U	UJ,C
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ, c
479-45-8	Tetryl	2.0	U	UJ, c
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ,C
479-45-8	Tetryl	2.0	U	UJ,C
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ,C
479-45-8	Tetryl	2.0	U	
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-2

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ,C
479-45-8	Tetryl	2.0	U	UJ,C
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-3

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ,C
479-45-8	Tetryl	2.0	U	UJ,C
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-4

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ.C
479-45-8	Tetryl	2.0	U	
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3BMS

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21436-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	2.8	
99-35-4	1,3,5-Trinitrobenzene	1.2	
121-82-4	RDX	2.9	
99-65-0	1,3-Dinitrobenzene	2.3	
118-96-7	2,4,6-Trinitrotoluene	2.6	
479-45-8	Tetryl	3.0	
98-95-3	Nitrobenzene	1.5	
121-14-2	2,4-Dinitrotoluene	2.1	
606-20-2	2,6-Dinitrotoluene	2.7	
35572-78-2	2-Amino-4,6-dinitrotoluene	2.7	
1946-51-0	4-Amino-2,6-dinitrotoluene	4.2	
88-72-2	2-Nitrotoluene	2.9	
99-99-0	4-Nitrotoluene	3.3	
99-08-1	3-Nitrotoluene	3.2	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3BMSD

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21436-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	3.0	
99-35-4	1,3,5-Trinitrobenzene	0.97	J
121-82-4	RDX	2.5	
99-65-0	1,3-Dinitrobenzene	2.2	
118-96-7	2,4,6-Trinitrotoluene	2.4	
479-45-8	Tetryl	2.8	
98-95-3	Nitrobenzene	1.4	
121-14-2	2,4-Dinitrotoluene	2.1	
606-20-2	2,6-Dinitrotoluene	2.7	
35572-78-2	2-Amino-4,6-dinitrotoluene	2.7	
1946-51-0	4-Amino-2,6-dinitrotoluene	4.2	
88-72-2	2-Nitrotoluene	3.0	
99-99-0	4-Nitrotoluene	3.3	
99-08-1	3-Nitrotoluene	3.1	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PLCSVA

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21436-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received:

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	2.1	
99-35-4	1,3,5-Trinitrobenzene	1.5	
121-82-4	RDX	2.4	
99-65-0	1,3-Dinitrobenzene	2.3	
118-96-7	2,4,6-Trinitrotoluene	2.0	
479-45-8	Tetryl	2.6	
98-95-3	Nitrobenzene	1.3	
121-14-2	2,4-Dinitrotoluene	2.0	
606-20-2	2,6-Dinitrotoluene	2.8	
35572-78-2	2-Amino-4,6-dinitrotoluene	2.6	
1946-51-0	4-Amino-2,6-dinitrotoluene	4.2	
88-72-2	2-Nitrotoluene	3.0	
99-99-0	4-Nitrotoluene	3.4	
99-08-1	3-Nitrotoluene	3.4	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-2

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/14/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-3

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-4

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: S2788-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
55-63-0	Nitroglycerin	10	U

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SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-1

Level (low/med): LOW Date Received: 11/14/02

% Solids: 84.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14000			P	
7440-36-0	Antimony	0.65	B	N	P	K,W
7440-38-2	Arsenic	4.5		N	P	L,M
7440-39-3	Barium	46.5		NE	P	↓
7440-41-7	Beryllium	0.53	B	NE	P	K,W
7440-43-9	Cadmium	0.12	B	N	P	K,W
7440-70-2	Calcium	26300		*E	P	J,S
7440-47-3	Chromium	24.7		NE	P	L,M
7440-48-4	Cobalt	6.7		N*E	P	↓
7440-50-8	Copper	0.16	U	N*E	P	UL,M
7439-89-6	Iron	23900		E	P	J,S
7439-92-1	Lead	19.4			P	
7439-95-4	Magnesium	15700		*E	P	J,K
7439-96-5	Manganese	318		E	P	J/S
7439-97-6	Mercury	0.042			CV	
7440-02-0	Nickel	6.5		NE	P	L,M
7440-09-7	Potassium	1010		*E	P	J,K
7782-49-2	Selenium	0.91		N	P	K,W
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	135	B		P	B,K
7440-28-0	Thallium	0.59	U	N	P	UL,M
7440-62-2	Vanadium	48.7		NE	P	L,M
7440-66-6	Zinc	27.1		NE	P	↓

Color Before: BROWN Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-3

Level (low/med): LOW Date Received: 11/14/02

% Solids: 71.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	47500			P	
7440-36-0	Antimony	0.49	U	N	P	ULim
7440-38-2	Arsenic	5.0		N	P	Lim
7440-39-3	Barium	94.3		NE	P	
7440-41-7	Beryllium	3.0		NE	P	
7440-43-9	Cadmium	0.34	B	N	P	K,W
7440-70-2	Calcium	1540		*E	P	J,S
7440-47-3	Chromium	65.7		NE	P	Lim
7440-48-4	Cobalt	6.3		N*E	P	
7440-50-8	Copper	20.9		N*E	P	
7439-89-6	Iron	43900		E	P	J,S
7439-92-1	Lead	8.4			P	
7439-95-4	Magnesium	9240		*E	P	J,K
7439-96-5	Manganese	213		E	P	J,S
7439-97-6	Mercury	0.13			CV	
7440-02-0	Nickel	36.0		NE	P	Lim
7440-09-7	Potassium	3800		*E	P	J,K
7782-49-2	Selenium	1.5		N	P	Lim
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	135	B		P	B,X
7440-28-0	Thallium	0.68	U	N	P	ULim
7440-62-2	Vanadium	88.6		NE	P	Lim
7440-66-6	Zinc	32.9		NE	P	

Color Before: BROWN Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB10C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-4

Level (low/med): LOW Date Received: 11/14/02

% Solids: 67.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	39900			P	
7440-36-0	Antimony	0.72	B	N	P	K,W
7440-38-2	Arsenic	6.2		N	P	L,M
7440-39-3	Barium	80.4		NE	P	↓
7440-41-7	Beryllium	2.3		NE	P	↓
7440-43-9	Cadmium	0.32	B	N	P	K,W
7440-70-2	Calcium	1830		*E	P	J,S
7440-47-3	Chromium	30.6		NE	P	L,M
7440-48-4	Cobalt	5.7		N*E	P	↓
7440-50-8	Copper	23.5		N*E	P	↓
7439-89-6	Iron	37600		E	P	J,S
7439-92-1	Lead	7.7			P	
7439-95-4	Magnesium	25800		*E	P	J,K
7439-96-5	Manganese	463		E	P	J,S
7439-97-6	Mercury	0.025	U		CV	
7440-02-0	Nickel	25.7		NE	P	L,M
7440-09-7	Potassium	4450		*E	P	J,K
7782-49-2	Selenium	1.1		N	P	K,W
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	121	B		P	B,X
7440-28-0	Thallium	0.69	U	N	P	UL,M
7440-62-2	Vanadium	62.5		NE	P	L,M
7440-66-6	Zinc	42.4		NE	P	↓

Color Before: RED Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-2

Level (low/med): LOW Date Received: 11/14/02

% Solids: 81.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17000			P	
7440-36-0	Antimony	0.43	U	N	P	UL,M
7440-38-2	Arsenic	9.1		N	P	L,M
7440-39-3	Barium	58.1		NE	P	↓
7440-41-7	Beryllium	0.42	B	NE	P	K,W
7440-43-9	Cadmium	0.08	B	N	P	K,W
7440-70-2	Calcium	2490		*E	P	J,S
7440-47-3	Chromium	24.0		NE	P	L,M
7440-48-4	Cobalt	3.2		N*E	P	↓
7440-50-8	Copper	14.8		N*E	P	↓
7439-89-6	Iron	32500		E	P	J,S
7439-92-1	Lead	44.2			P	
7439-95-4	Magnesium	1290		*E	P	J,K
7439-96-5	Manganese	294		E	P	J,S
7439-97-6	Mercury	0.18			CV	
7440-02-0	Nickel	6.3		NE	P	L,M
7440-09-7	Potassium	949		*E	P	J,K
7782-49-2	Selenium	2.8		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	206	B		P	B,K
7440-28-0	Thallium	0.59	U	N	P	UL,M
7440-62-2	Vanadium	56.6		NE	P	L,M
7440-66-6	Zinc	73.3		NE	P	↓

Color Before: BROWN Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-18

Level (low/med): LOW Date Received: 11/15/02

% Solids: 77.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	19100			P	
7440-36-0	Antimony	0.47	U	N	P	UL,M
7440-38-2	Arsenic	6.6		N	P	L,M
7440-39-3	Barium	191		NE	P	↓
7440-41-7	Beryllium	1.2		NE	P	K,W
7440-43-9	Cadmium	0.14	B	N	P	K,W
7440-70-2	Calcium	3120		*E	P	J,S
7440-47-3	Chromium	27.6		NE	P	L,M
7440-48-4	Cobalt	13.2		N*E	P	↓
7440-50-8	Copper	12.2		N*E	P	↓
7439-89-6	Iron	28200		E	P	J,S
7439-92-1	Lead	16.6			P	
7439-95-4	Magnesium	5890		*E	P	J,K
7439-96-5	Manganese	433		E	P	J,S
7439-97-6	Mercury	0.059			CV	
7440-02-0	Nickel	18.6		NE	P	L,M
7440-09-7	Potassium	1980		*E	P	J,K
7782-49-2	Selenium	1.4		N	P	L,M
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	142	B		P	B,X
7440-28-0	Thallium	0.64	U	N	P	UL,M
7440-62-2	Vanadium	48.2		NE	P	L,M
7440-66-6	Zinc	40.3		NE	P	↓

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-19

Level (low/med): LOW Date Received: 11/15/02

% Solids: 62.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	36000			P	
7440-36-0	Antimony	0.59	U	N	P	ULim
7440-38-2	Arsenic	6.7		N	P	Lim
7440-39-3	Barium	89.3		NE	P	↓
7440-41-7	Beryllium	1.9		NE	P	Lim
7440-43-9	Cadmium	0.24	B	N	P	KW
7440-70-2	Calcium	1590		*E	P	JS
7440-47-3	Chromium	45.5		NE	P	Lim
7440-48-4	Cobalt	9.9		N*E	P	↓
7440-50-8	Copper	42.2		N*E	P	↓
7439-89-6	Iron	42100		E	P	JS
7439-92-1	Lead	13.0			P	
7439-95-4	Magnesium	13500		*E	P	JK
7439-96-5	Manganese	515		E	P	JS
7439-97-6	Mercury	0.048	B		CV	
7440-02-0	Nickel	32.9		NE	P	Lim
7440-09-7	Potassium	2570		*E	P	JK
7782-49-2	Selenium	1.7		N	P	Lim
7440-22-4	Silver	0.11	U		P	
7440-23-5	Sodium	234	B		P	B, X
7440-28-0	Thallium	0.81	U	N	P	ULim
7440-62-2	Vanadium	73.2		NE	P	Lim
7440-66-6	Zinc	47.5		NE	P	↓

Color Before: ORANGE Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-20

Level (low/med): LOW Date Received: 11/15/02

% Solids: 69.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21000			P	
7440-36-0	Antimony	0.54	B	N	P	K,W
7440-38-2	Arsenic	2.4		N	P	L,M
7440-39-3	Barium	49.3		NE	P	↓
7440-41-7	Beryllium	1.3		NE	P	K,W
7440-43-9	Cadmium	0.30	B	N	P	L,M
7440-70-2	Calcium	24100		*E	P	J,S
7440-47-3	Chromium	37.9		NE	P	L,M
7440-48-4	Cobalt	10.2		N*E	P	↓
7440-50-8	Copper	12.6		N*E	P	↓
7439-89-6	Iron	27000		E	P	J,S
7439-92-1	Lead	6.3			P	
7439-95-4	Magnesium	50800		*E	P	J,K
7439-96-5	Manganese	386		E	P	J,S
7439-97-6	Mercury	0.024	U		CV	
7440-02-0	Nickel	22.7		NE	P	L,M
7440-09-7	Potassium	7810		*E	P	J,K
7782-49-2	Selenium	0.46	U	N	P	UL,M
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	307			P	B,X
7440-28-0	Thallium	0.71	U	N	P	UL,M
7440-62-2	Vanadium	59.3		NE	P	L,M
7440-66-6	Zinc	40.1		NE	P	↓

Color Before: BROWN Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-15

Level (low/med): LOW Date Received: 11/15/02

% Solids: 74.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	30800			P	
7440-36-0	Antimony	0.52	B	N	P	K|W
7440-38-2	Arsenic	5.9		N	P	L|M
7440-39-3	Barium	43.2		NE	P	↓
7440-41-7	Beryllium	2.4		NE	P	↓
7440-43-9	Cadmium	0.30	B	N	P	K|W
7440-70-2	Calcium	1050		*E	P	J|S
7440-47-3	Chromium	46.5		NE	P	L|M
7440-48-4	Cobalt	19.8		N*E	P	↓
7440-50-8	Copper	25.2		N*E	P	↓
7439-89-6	Iron	37300		E	P	J|S
7439-92-1	Lead	28.4			P	
7439-95-4	Magnesium	31500		*E	P	J|K
7439-96-5	Manganese	307		E	P	J|S
7439-97-6	Mercury	0.091			CV	
7440-02-0	Nickel	47.5		NE	P	L|M
7440-09-7	Potassium	10100		*E	P	J|K
7782-49-2	Selenium	1.3		N	P	K|W
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	286			P	B|K
7440-28-0	Thallium	0.69	U	N	P	UL|M
7440-62-2	Vanadium	70.8		NE	P	L|M
7440-66-6	Zinc	48.3		NE	P	↓

Color Before: BROWN Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-16

Level (low/med): LOW Date Received: 11/15/02

% Solids: 66.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	30700			P	
7440-36-0	Antimony	0.53	U	N	P	UL,M
7440-38-2	Arsenic	8.0		N	P	L,M
7440-39-3	Barium	77.7		NE	P	↓
7440-41-7	Beryllium	2.0		NE	P	
7440-43-9	Cadmium	0.50	B	N	P	K,W
7440-70-2	Calcium	1700		*E	P	
7440-47-3	Chromium	42.7		NE	P	L,M
7440-48-4	Cobalt	9.8		N*E	P	↓
7440-50-8	Copper	38.3		N*E	P	
7439-89-6	Iron	37800		E	P	J,S
7439-92-1	Lead	17.2			P	
7439-95-4	Magnesium	18300		*E	P	J,K
7439-96-5	Manganese	739		E	P	J,S
7439-97-6	Mercury	0.088			CV	
7440-02-0	Nickel	31.6		NE	P	L,M
7440-09-7	Potassium	4820		*E	P	J,K
7782-49-2	Selenium	1.4		N	P	K,W
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	202	B		P	B,X
7440-28-0	Thallium	0.73	U	N	P	UL,M
7440-62-2	Vanadium	64.0		NE	P	L,M
7440-66-6	Zinc	65.1		NE	P	↓

Color Before: ORANGE Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-11

Level (low/med): LOW Date Received: 11/14/02

% Solids: 82.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13000			P	
7440-36-0	Antimony	0.50	B	N	P	K,W
7440-38-2	Arsenic	3.4		N	P	L,M
7440-39-3	Barium	68.6		NE	P	↓
7440-41-7	Beryllium	0.48	B	NE	P	K,W
7440-43-9	Cadmium	0.09	B	N	P	K,W
7440-70-2	Calcium	15700		*E	P	J,S
7440-47-3	Chromium	24.5		NE	P	L,M
7440-48-4	Cobalt	5.1		N*E	P	↓
7440-50-8	Copper	7.8		N*E	P	↓
7439-89-6	Iron	17400		E	P	J,S
7439-92-1	Lead	20.5			P	
7439-95-4	Magnesium	9500		*E	P	J,K
7439-96-5	Manganese	478		E	P	J,S
7439-97-6	Mercury	0.098			CV	
7440-02-0	Nickel	6.1		NE	P	L,M
7440-09-7	Potassium	889		*E	P	J,K
7782-49-2	Selenium	1.2		N	P	K,W
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	249			P	B,K
7440-28-0	Thallium	0.60	U	N	P	UL,M
7440-62-2	Vanadium	39.1		NE	P	L,M
7440-66-6	Zinc	79.9		NE	P	↓

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-13

Level (low/med): LOW Date Received: 11/14/02

% Solids: 73.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21500			P	
7440-36-0	Antimony	0.50	U	N	P	UL,M
7440-38-2	Arsenic	2.9		N	P	L,M
7440-39-3	Barium	68.0		NE	P	↓
7440-41-7	Beryllium	1.3		NE	P	K,W
7440-43-9	Cadmium	0.05	U	N	P	UL,M
7440-70-2	Calcium	1940		*E	P	J,S
7440-47-3	Chromium	30.0		NE	P	L,M
7440-48-4	Cobalt	9.0		N*E	P	↓
7440-50-8	Copper	14.1		N*E	P	↓
7439-89-6	Iron	25300		E	P	J,S
7439-92-1	Lead	9.9			P	
7439-95-4	Magnesium	15900		*E	P	J,K
7439-96-5	Manganese	266		E	P	J,S
7439-97-6	Mercury	0.060			CV	
7440-02-0	Nickel	19.9		NE	P	L,M
7440-09-7	Potassium	2560		*E	P	J,K
7782-49-2	Selenium	0.93		N	P	K,W
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	316			P	B,X
7440-28-0	Thallium	0.69	U	N	P	UL,M
7440-62-2	Vanadium	51.2		NE	P	L,M
7440-66-6	Zinc	38.6		NE	P	↓

Color Before: GREY Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

vc. 24

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-12

Level (low/med): LOW Date Received: 11/14/02

% Solids: 79.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12600			P	
7440-36-0	Antimony	0.43	U	N	P	UL,M
7440-38-2	Arsenic	5.6		N	P	L,M
7440-39-3	Barium	101		NE	P	↓
7440-41-7	Beryllium	0.67		NE	P	K,W
7440-43-9	Cadmium	0.24	B	N	P	K,W
7440-70-2	Calcium	17800		*E	P	J,S
7440-47-3	Chromium	21.5		NE	P	L,M
7440-48-4	Cobalt	7.9		N*E	P	↓
7440-50-8	Copper	7.6		N*E	P	↓
7439-89-6	Iron	22100		E	P	J,S
7439-92-1	Lead	39.1			P	
7439-95-4	Magnesium	12200		*E	P	J,K
7439-96-5	Manganese	348		E	P	J,S
7439-97-6	Mercury	0.093			CV	
7440-02-0	Nickel	11.5		NE	P	L,M
7440-09-7	Potassium	1940		*E	P	J,K
7782-49-2	Selenium	1.0		N	P	K,W
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	291			P	B,K
7440-28-0	Thallium	0.59	U	N	P	UL,M
7440-62-2	Vanadium	36.9		NE	P	L,M
7440-66-6	Zinc	88.3		NE	P	↓

Color Before: GREY Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-6

Level (low/med): LOW Date Received: 11/14/02

% Solids: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17700			P	
7440-36-0	Antimony	0.43	U	N	P	UL,M
7440-38-2	Arsenic	4.0		N	P	L,M
7440-39-3	Barium	50.0		NE	P	↓
7440-41-7	Beryllium	0.54	B	NE	P	K,W
7440-43-9	Cadmium	0.09	B	N	P	K,W
7440-70-2	Calcium	9430		*E	P	J,S
7440-47-3	Chromium	21.6		NE	P	L,M
7440-48-4	Cobalt	8.2		N*E	P	↓
7440-50-8	Copper	2.1		N*E	P	↓
7439-89-6	Iron	25900		E	P	
7439-92-1	Lead	17.5			P	
7439-95-4	Magnesium	5690		*E	P	J,K
7439-96-5	Manganese	323		E	P	J,S
7439-97-6	Mercury	0.096			CV	
7440-02-0	Nickel	9.2		NE	P	L,M
7440-09-7	Potassium	1330		*E	P	J,K
7782-49-2	Selenium	1.3		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	132	B		P	B,X
7440-28-0	Thallium	0.59	U	N	P	UL,M
7440-62-2	Vanadium	49.4		NE	P	L,M
7440-66-6	Zinc	33.9		NE	P	↓

Color Before: BROWN Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-8

Level (low/med): LOW Date Received: 11/14/02

% Solids: 68.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21800			P	
7440-36-0	Antimony	0.53	B	N	P	K,W
7440-38-2	Arsenic	6.5		N	P	L,M
7440-39-3	Barium	49.7		NE	P	↓
7440-41-7	Beryllium	1.4		NE	P	↓
7440-43-9	Cadmium	0.17	B	N	P	K,W
7440-70-2	Calcium	2090		*E	P	J,S
7440-47-3	Chromium	47.0		NE	P	L,M
7440-48-4	Cobalt	6.4		N*E	P	↓
7440-50-8	Copper	38.0		N*E	P	↓
7439-89-6	Iron	26100		E	P	J,S
7439-92-1	Lead	16.5			P	
7439-95-4	Magnesium	26100		*E	P	J,K
7439-96-5	Manganese	294		E	P	J,S
7439-97-6	Mercury	0.048			CV	
7440-02-0	Nickel	26.1		NE	P	L,M
7440-09-7	Potassium	5570		*E	P	J,K
7782-49-2	Selenium	0.69	B	N	P	K,W
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	1950			P	
7440-28-0	Thallium	0.71	U	N	P	U,L,M
7440-62-2	Vanadium	69.9		NE	P	L,M
7440-66-6	Zinc	46.7		NE	P	↓

Color Before: MUSTARD Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB7C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-9

Level (low/med): LOW Date Received: 11/14/02

% Solids: 70.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	34200			P	
7440-36-0	Antimony	0.83	B	N	P	K,W
7440-38-2	Arsenic	5.1		N	P	L,M
7440-39-3	Barium	54.7		NE	P	↓
7440-41-7	Beryllium	1.6		NE	P	↓
7440-43-9	Cadmium	0.29	B	N	P	K,W
7440-70-2	Calcium	2570		*E	P	J,S
7440-47-3	Chromium	40.9		NE	P	L,M
7440-48-4	Cobalt	11.1		N*E	P	↓
7440-50-8	Copper	18.6		N*E	P	↓
7439-89-6	Iron	31100		E	P	J,S
7439-92-1	Lead	6.6			P	
7439-95-4	Magnesium	47500		*E	P	J,K
7439-96-5	Manganese	162		E	P	J,S
7439-97-6	Mercury	0.027	B		CV	
7440-02-0	Nickel	27.5		NE	P	L,M
7440-09-7	Potassium	7610		*E	P	J,K
7782-49-2	Selenium	0.80		N	P	K,W
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	6670			P	
7440-28-0	Thallium	0.69	U	N	P	U,L,M
7440-62-2	Vanadium	62.4		NE	P	L,M
7440-66-6	Zinc	53.5		NE	P	↓

Color Before: MUSTARD Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-7

Level (low/med): LOW Date Received: 11/14/02

% Solids: 70.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5720			P	
7440-36-0	Antimony	0.56	B	N	P	KIW
7440-38-2	Arsenic	0.98	B	N	P	↓
7440-39-3	Barium	35.5		NE	P	LIM
7440-41-7	Beryllium	0.29	B	NE	P	KIW
7440-43-9	Cadmium	0.30	B	N	P	↓
7440-70-2	Calcium	6250		*E	P	JIS
7440-47-3	Chromium	24.8		NE	P	LIM
7440-48-4	Cobalt	5.1		N*E	P	↓
7440-50-8	Copper	9.9		N*E	P	↓
7439-89-6	Iron	10900		E	P	JIS
7439-92-1	Lead	15.0			P	
7439-95-4	Magnesium	2200		*E	P	JIK
7439-96-5	Manganese	135		E	P	JIS
7439-97-6	Mercury	1.8			CV	
7440-02-0	Nickel	15.0		NE	P	LIM
7440-09-7	Potassium	482		*E	P	JIK
7782-49-2	Selenium	0.61	B	N	P	KIW
7440-22-4	Silver	0.82			P	
7440-23-5	Sodium	598			P	
7440-28-0	Thallium	0.72	U	N	P	ULIM
7440-62-2	Vanadium	15.4		NE	P	LIM
7440-66-6	Zinc	31.2		NE	P	↓

Color Before: BLACK Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-5

Level (low/med): LOW Date Received: 11/14/02

% Solids: 76.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17000			P	
7440-36-0	Antimony	0.57	B	N	P	K,W
7440-38-2	Arsenic	7.2		N	P	L,M
7440-39-3	Barium	77.5		NE	P	↓
7440-41-7	Beryllium	0.78		NE	P	↓
7440-43-9	Cadmium	0.10	B	N	P	K,W
7440-70-2	Calcium	7200		*E	P	J,S
7440-47-3	Chromium	29.5		NE	P	L,M
7440-48-4	Cobalt	10.8		N*E	P	↓
7440-50-8	Copper	16.1		N*E	P	↓
7439-89-6	Iron	27900		E	P	J,S
7439-92-1	Lead	52.6			P	
7439-95-4	Magnesium	5940		*E	P	J,K
7439-96-5	Manganese	524		E	P	J,S
7439-97-6	Mercury	0.40			CV	
7440-02-0	Nickel	10.8		NE	P	L,M
7440-09-7	Potassium	1300		*E	P	J,K
7782-49-2	Selenium	1.7		N	P	
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	498			P	
7440-28-0	Thallium	0.64	U	N	P	U,L,M
7440-62-2	Vanadium	51.1		NE	P	L,M
7440-66-6	Zinc	79.0		NE	P	↓

Color Before: GREY Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-10

Level (low/med): LOW Date Received: 11/14/02

% Solids: 72.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17700			P	
7440-36-0	Antimony	0.49	U	N	P	UL,M
7440-38-2	Arsenic	3.3		N	P	L,M
7440-39-3	Barium	65.3		NE	P	↓
7440-41-7	Beryllium	0.88		NE	P	↓
7440-43-9	Cadmium	1.7		N	P	↓L,M
7440-70-2	Calcium	41900		*E	P	
7440-47-3	Chromium	32.0		NE	P	L,M
7440-48-4	Cobalt	4.3		N*E	P	↓
7440-50-8	Copper	23.2		N*E	P	↓
7439-89-6	Iron	18800		E	P	J,S
7439-92-1	Lead	11.8			P	
7439-95-4	Magnesium	29100		*E	P	J,K
7439-96-5	Manganese	194		E	P	J,S
7439-97-6	Mercury	0.68			CV	
7440-02-0	Nickel	18.9		NE	P	L,M
7440-09-7	Potassium	4280		*E	P	J,K
7782-49-2	Selenium	0.56	B	N	P	K,W
7440-22-4	Silver	4.6			P	
7440-23-5	Sodium	1540			P	
7440-28-0	Thallium	0.68	U	N	P	UL,M
7440-62-2	Vanadium	38.0		NE	P	L,M
7440-66-6	Zinc	42.6		NE	P	↓

Color Before: GREY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-3

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-14

Level (low/med): LOW Date Received: 11/15/02

% Solids: 68.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4760			P	
7440-36-0	Antimony	1.7		N	P	K, W
7440-38-2	Arsenic	20.8		N	P	Lim
7440-39-3	Barium	97.1		NE	P	↓
7440-41-7	Beryllium	0.25	B	NE	P	K, W
7440-43-9	Cadmium	0.53	B	N	P	↓
7440-70-2	Calcium	5710		*E	P	J, S
7440-47-3	Chromium	31.2		NE	P	Lim
7440-48-4	Cobalt	3.2		N*E	P	↓
7440-50-8	Copper	35.8		N*E	P	↓
7439-89-6	Iron	66200		E	P	J/S
7439-92-1	Lead	309			P	
7439-95-4	Magnesium	1180		*E	P	J, K
7439-96-5	Manganese	445		E	P	J/S
7439-97-6	Mercury	5.3			CV	
7440-02-0	Nickel	16.3		NE	P	Lim
7440-09-7	Potassium	495		*E	P	J, K
7782-49-2	Selenium	3.7		N	P	Lim
7440-22-4	Silver	0.45	B		P	K, W
7440-23-5	Sodium	495			P	
7440-28-0	Thallium	0.73	U	N	P	ULim
7440-62-2	Vanadium	7.4		NE	P	Lim
7440-66-6	Zinc	198		NE	P	↓

Color Before: GREY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-4

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Lab Sample ID: S2788-17

Level (low/med): LOW Date Received: 11/15/02

% Solids: 69.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	24500			P	
7440-36-0	Antimony	0.58	B	N	P	K,W
7440-38-2	Arsenic	3.0		N	P	L,M
7440-39-3	Barium	30.4		NE	P	↓
7440-41-7	Beryllium	2.8		NE	P	↓
7440-43-9	Cadmium	0.34	B	N	P	K,W
7440-70-2	Calcium	2020		*E	P	J,S
7440-47-3	Chromium	41.3		NE	P	L,M
7440-48-4	Cobalt	11.3		N*E	P	↓
7440-50-8	Copper	7.9		N*E	P	↓
7439-89-6	Iron	25100		E	P	J,S
7439-92-1	Lead	3.4			P	
7439-95-4	Magnesium	42100		*E	P	J,K
7439-96-5	Manganese	300		E	P	J,S
7439-97-6	Mercury	0.023	U		CV	
7440-02-0	Nickel	31.6		NE	P	L,M
7440-09-7	Potassium	10800		*E	P	J,K
7782-49-2	Selenium	0.62	B	N	P	K,W
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	191	B		P	B,K
7440-28-0	Thallium	0.68	U	N	P	UL,M
7440-62-2	Vanadium	51.8		NE	P	L,M
7440-66-6	Zinc	43.5		NE	P	↓

Color Before: ORANGE Clarity Before: Texture: CLAY

Color After: YELLOW Clarity After: Artifacts:

Comments:

DATA VALIDATION WORKSHEET

Volatile Organic Analysis by GC/MS

Reviewer: RA
Date: 2/14/03
DV Level: II (III) IV
Review Document:
__X__ NFG - Region III Modifications
__X__ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: S2788
Test Name: 8260B
Method No.: VOC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If the temperature of the cooler was elevated (> 10 °C) or bubble size in aqueous sample was too big (tiny bubble is OK.), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP? QAPP say - no HCl preservation.	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous unpreserved - 7 days for aromatic compounds All others - 14 days.	✓		
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

Collected	Analyzed
11/13/02	11/26/02, 11/27/02, (11/28/02)
11/14/02	11/27/02, 11/28/02 (11/29/02)

40SB4CRE, 40SB3ARE, 40SB3BRE, 40SB3CRE, 40SB4BRE one day outside ht L/UL/h unless flagged for MB. D-4RE, 40SB6ARE, 40SB6FRE, 40SB6CRE, D-2RE, D-3RE

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per GCMS, 20 samples, batch, matrix, and level)?	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common volatile lab contaminants - methylene chloride, acetone, and 2-butanone) the amount in the associated blank.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If Yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the DV report.	✓		

Notes: See attached POS <5x → B,Z

11/14/02 EQB-3 MCl3 3 1,2,4-TCB 0.8 ug/L → 7 5x no flag

11/15/02 EQB-4 " 3

11/14/02 TRIP blank MCl3 3 toluene 1 MCl3 B,7C

(over flagged) LOD+

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 15% and %D < ± 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < CL? CL >0.10 for chloromethane, 1,1-dichloroethane, & bromoform or >0.30 for chlorobenzene & 1,1,2,2-tetrachloroethane. If yes, L(+)/R(-).		✓	

Notes: See attached

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	✓		
5.2	Are BFB enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
5.3	Have all samples been analyzed within twelve hours of the BFB tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for BFB been met for each instrument used?	✓		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery							Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?						✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?							✓	
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?						✓		
	If any system monitoring compound(s) in the volatile fraction is out of specification, there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.								
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? DV report should indicate that extraction efficiency/ method accuracy cannot be verified.								✓
		1 or more <10%	1 high/low	2 or 3 high/low	2 or 3 all low	2 or 3 all high			
	Positives	L	J	J	L	K			
	Non-detects	R	UJ	UJ	UL	NONE			
	Note: The B qualifier remains over surrogate flagging.								

Notes: See attached

Pos Kis unless prev.

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: acetone 47% < 50-150 Prev flagged in parent 405B3B
NO more action

		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).		✓	
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes: See attached

405B7F all out, J|UJ|i re-analyzed w/similar, use original
V14- DCB-d4 (-95%) → Rii in acs. compds.

D-2 re-analyzed w/similar/J|UJ|i use original
405B6A all out re-analyzed good use re-analyses
405B6F 2 out, re-analyses good, use " "
405B6C 1 out, re-analyses outside ht. use original
R|UJ|i

D-3 all 3 out - re-analyses all good use re-analyses
405B4B, 405B4C one out use original re-analyse outside ht- J|UJ|i

10.0 Field Duplicate

		Yes	No	NA
10.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)? For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.	✓		
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		✓	

Notes:

405B7F	D-2	RPD	405B7F	D-2	%RPD	405B4C	D-4	RPD
CS2 bondisulfide 58	52	OK	4M2P 53	17U	OK	acetone 280	36	154%
Trichlorof 4	7U	OK	toluene 9	16	56%	2-buta 56	32U	OK
(acetone) 410	60	(148)	(xylene) 8	(45)		TCE 19	9	OK
(2-butanone) 87	17U		Ethylbenene 140	11	OK	4M2P 11	32U	OK
benzene 1	1	OK				xylene 5	3	OK
TCE 8	4	OK				MCl3 208	3	OK

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification

		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".	✓		

Notes: POS TIC → NJ, E

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported:			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Notes:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKUA

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21421-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21421-1RA62

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVQ

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21488-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21488-1R2A61S

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKUB

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21421-2

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21421-2A61

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/27/02

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	1	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKUC

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21421-3

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21421-3RA52

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	J
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	2	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKUC

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21421-3

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21421-3RA52

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	1	J
1330-20-7	Xylene (total)	15	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVT

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1A

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1B59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	4	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVT

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1A

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1B59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	0.5	J
106-46-7	1,4-Dichlorobenzene	0.4	J
95-50-1	1,2-Dichlorobenzene	0.5	J
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	4	J
1330-20-7	Xylene (total)	15	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVX

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1A59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	1	J
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	2	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVX

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1A59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	0.3	J
106-46-7	1,4-Dichlorobenzene	0.3	J
95-50-1	1,2-Dichlorobenzene	0.3	J
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	1	J
1330-20-7	Xylene (total)	15	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVU

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-2

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-2A59

Level: (low/med) MED Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:(5000)(ul) Soil Aliquot Volume: 100(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	250	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	250	U
74-83-9	Bromomethane	50	J
75-00-3	Chloroethane	250	U
75-69-4	Trichlorofluoromethane	250	U
75-35-4	1,1-Dichloroethene	250	U
75-15-0	Carbon disulfide	250	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	250	U
67-64-1	Acetone	630	U
75-09-2	Methylene Chloride	250	U
156-60-5	trans-1,2-Dichloroethene	250	U
1634-04-4	Methyl-tert-butyl ether	250	U
75-34-3	1,1-Dichloroethane	250	U
156-59-2	cis-1,2-Dichloroethene	250	U
78-93-3	2-butanone	630	U
67-66-3	Chloroform	250	U
71-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	250	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	250	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-pentanone	630	U
108-88-3	Toluene	130	J
10061-02-6	trans-1,3-Dichloropropene	250	U
79-00-5	1,1,2-Trichloroethane	250	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-hexanone	630	U
124-48-1	Dibromochloromethane	250	U
106-93-4	1,2-Dibromoethane	250	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVU

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-2

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-2A59

Level: (low/med) MED Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:(5000)(ul) Soil Aliquot Volume: 100(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	250	U
100-42-5	Styrene	250	U
75-25-2	Bromoform	250	U
98-82-8	Isopropyl Benzene	250	U
79-34-5	1,1,2,2-Tetrachloroethane	250	U
541-73-1	1,3-Dichlorobenzene	250	U
106-46-7	1,4-Dichlorobenzene	250	U
95-50-1	1,2-Dichlorobenzene	250	U
96-12-8	1,2-Dibromo-3-Chloropropane	250	U
120-82-1	1,2,4-Trichlorobenzene	51	J
1330-20-7	Xylene (total)	250	U
79-20-9	Methyl acetate	250	U
110-82-7	Cyclohexane	250	U
108-87-2	Methylcyclohexane	250	U

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5973HP61 Calibration Date: 11/27/02 Time: 1017

Lab File ID: CU021127A61 Init. Calib. Date(s): 11/26/02 11/26/02

Init. Calib. Times: 1023 1254

GC Column: RTX-VMS ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.4080000	0.3588213	0.3588213	0.001	-12.05	90.00	AVRG
Chloromethane	0.6460000	0.5396986	0.5396986	0.1	-16.46	90.00	AVRG
Vinyl Chloride	0.5430000	0.4597170	0.4597170	0.001	-15.34	20.00	AVRG
Bromomethane ✓	0.3250000	0.2553295	0.2553295	0.001	-21.44	90.00	AVRG
Chloroethane	0.2850000	0.2337788	0.2337788	0.001	-17.97	90.00	AVRG
Trichlorofluoromethane	241.00544	250.00000	0.5251832	0.001	-3.60	90.00	2RDR
1,1-Dichloroethene	0.2480000	0.2347992	0.2347992	0.001	-5.32	20.00	AVRG
Carbon disulfide	0.7990000	0.7278933	0.7278933	0.001	-8.90	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	0.3500000	0.3123301	0.3123301	0.001	-10.76	90.00	AVRG
Acetone	585.62410	625.00000	0.1038715	0.001	-6.30	90.00	2RDR
Methylene Chloride	244.07924	250.00000	0.3052367	0.001	-2.37	90.00	2RDR
trans-1,2-Dichloroethene	0.2680000	0.2509136	0.2509136	0.001	-6.38	90.00	AVRG
Methyl-tert-butyl ether	0.7250000	0.6977345	0.6977345	0.001	-3.76	90.00	AVRG
1,1-Dichloroethane	0.5460000	0.4837127	0.4837127	0.1	-11.41	90.00	AVRG
cis-1,2-Dichloroethene	0.2840000	0.2580884	0.2580884	0.001	-9.12	90.00	AVRG
2-butanone	0.1980000	0.1675370	0.1675370	0.001	-15.38	90.00	AVRG
Chloroform	0.4710000	0.4226828	0.4226828	0.001	-10.26	20.00	AVRG
1,1,1-Trichloroethane	0.3410000	0.3004224	0.3004224	0.001	-11.90	90.00	AVRG
Carbon Tetrachloride	0.3480000	0.3051494	0.3051494	0.001	-12.31	90.00	AVRG
Benzene	1.0050000	0.8883566	0.8883566	0.001	-11.61	90.00	AVRG
1,2-Dichloroethane	0.3480000	0.2989805	0.2989805	0.001	-14.09	90.00	AVRG
Trichloroethene	0.1530000	0.1532884	0.1532884	0.001	0.19	90.00	AVRG
1,2-Dichloropropane	0.2230000	0.2264906	0.2264906	0.001	1.56	20.00	AVRG
Bromodichloromethane	259.79884	250.00000	0.2163766	0.001	3.92	90.00	2RDR
cis-1,3-Dichloropropene	235.67668	250.00000	0.2895264	0.001	-5.73	90.00	2RDR
4-Methyl-2-pentanone	628.95109	625.00000	0.4418272	0.001	0.63	90.00	2RDR
Toluene	0.6820000	0.6978820	0.6978820	0.001	2.33	20.00	AVRG
trans-1,3-Dichloropropene	271.20178	250.00000	0.4159625	0.001	8.48	90.00	2RDR
1,1,2-Trichloroethane	258.97208	250.00000	0.3066247	0.001	3.59	90.00	2RDR
Tetrachloroethene	0.2390000	0.2421321	0.2421321	0.001	1.31	90.00	AVRG
2-hexanone	614.55582	625.00000	0.3250348	0.001	-1.67	90.00	2RDR
Dibromochloromethane	0.3220000	0.3298973	0.3298973	0.001	2.45	90.00	AVRG
1,2-Dibromoethane	259.86345	250.00000	0.3056682	0.001	3.94	90.00	2RDR
Chlorobenzene	0.9010000	0.8708604	0.8708604	0.3	-3.34	90.00	AVRG
Ethylbenzene	0.4460000	0.4315333	0.4315333	0.001	-3.24	20.00	AVRG
Styrene	254.14998	250.00000	0.8423877	0.001	1.66	90.00	2RDR
Bromoform	244.20795	250.00000	0.2772624	0.1	-2.32	90.00	2RDR
Isopropyl Benzene	1.3390000	1.3137961	1.3137961	0.001	-1.88	90.00	AVRG
1,1,2,2-Tetrachloroethane	0.8140000	0.7943170	0.7943170	0.3	-2.42	90.00	AVRG
1,3-Dichlorobenzene	1.2580000	1.1422510	1.1422510	0.001	-9.20	90.00	AVRG
1,4-Dichlorobenzene	1.5270000	1.3963569	1.3963569	0.001	-8.56	90.00	AVRG
1,2-Dichlorobenzene	1.2880000	1.1674287	1.1674287	0.001	-9.36	90.00	AVRG

W.C

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: F50052 Calibration Date: 11/28/02 Time: 1236

Lab File ID: CS021128A52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

GC Column: EQUITY624 ID: 0.53 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.5020000	0.3603931	0.3603931	0.001	-28.21	90.00	AVRG
Chloromethane	0.3250000	0.2437043	0.2437043	0.1	-25.01	90.00	AVRG
Vinyl Chloride	0.3200000	0.2860558	0.2860558	0.001	-10.61	20.00	AVRG
Bromomethane	0.3490000	0.3267143	0.3267143	0.001	-6.38	90.00	AVRG
Chloroethane	0.1800000	0.1859563	0.1859563	0.001	3.31	90.00	AVRG
Trichlorofluoromethane	0.4800000	0.5081417	0.5081417	0.001	5.86	90.00	AVRG
1,1-Dichloroethene	0.2680000	0.2945842	0.2945842	0.001	9.92	20.00	AVRG
Carbon disulfide	0.9180000	1.0137061	1.0137061	0.001	10.42	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	0.7630000	0.8406115	0.8406115	0.001	10.17	90.00	AVRG
Acetone	580.62158	625.00000	0.0365319	0.001	-7.10	90.00	2RDR
Methylene Chloride	251.66129	250.00000	0.3163082	0.001	0.66	90.00	2RDR
trans-1,2-Dichloroethene	0.3150000	0.3350918	0.3350918	0.001	6.38	90.00	AVRG
Methyl-tert-butyl ether	0.5510000	0.5219128	0.5219128	0.001	-5.28	90.00	AVRG
1,1-Dichloroethane	0.6460000	0.6876811	0.6876811	0.1	6.45	90.00	AVRG
cis-1,2-Dichloroethene	0.3300000	0.3378331	0.3378331	0.001	2.37	90.00	AVRG
2-butanone	0.0820000	0.0637950	0.0637950	0.001	-22.20	90.00	AVRG
Chloroform	0.6020000	0.6508198	0.6508198	0.001	8.11	20.00	AVRG
1,1,1-Trichloroethane	0.5000000	0.5567126	0.5567126	0.001	11.34	90.00	AVRG
Carbon Tetrachloride	0.4830000	0.5413464	0.5413464	0.001	12.08	90.00	AVRG
Benzene	0.9050000	0.8864001	0.8864001	0.001	-2.06	90.00	AVRG
1,2-Dichloroethane	0.2940000	0.3106624	0.3106624	0.001	5.67	90.00	AVRG
Trichloroethene	0.3580000	0.3489416	0.3489416	0.001	-2.53	90.00	AVRG
1,2-Dichloropropane	0.4450000	0.4537663	0.4537663	0.001	1.97	20.00	AVRG
Bromodichloromethane	0.5840000	0.6245716	0.6245716	0.001	6.95	90.00	AVRG
cis-1,3-Dichloropropene	0.5040000	0.5057350	0.5057350	0.001	0.34	90.00	AVRG
4-Methyl-2-pentanone	0.2930000	0.2450296	0.2450296	0.001	-16.37	90.00	AVRG
Toluene	0.7950000	0.7949553	0.7949553	0.001	-0.00	20.00	AVRG
trans-1,3-Dichloropropene	0.4890000	0.4873313	0.4873313	0.001	-0.34	90.00	AVRG
1,1,2-Trichloroethane	0.3820000	0.3521127	0.3521127	0.001	-7.82	90.00	AVRG
Tetrachloroethene	0.4160000	0.4019304	0.4019304	0.001	-3.38	90.00	AVRG
2-hexanone	0.2040000	0.1707904	0.1707904	0.001	-16.28	90.00	AVRG
Dibromochloromethane	0.6600000	0.6316844	0.6316844	0.001	-4.29	90.00	AVRG
1,2-Dibromoethane	0.5340000	0.4941603	0.4941603	0.001	-7.46	90.00	AVRG
Chlorobenzene	0.9770000	0.9317140	0.9317140	0.3	-4.64	90.00	AVRG
Ethylbenzene	0.4760000	0.4783339	0.4783339	0.001	0.49	20.00	AVRG
Styrene	0.8820000	0.8825836	0.8825836	0.001	0.07	90.00	AVRG
Bromoform	0.4170000	0.3658007	0.3658007	0.1	-12.28	90.00	AVRG
Isopropyl Benzene	1.5400000	1.5228065	1.5228065	0.001	-1.12	90.00	AVRG
1,1,2,2-Tetrachloroethane	1.3620000	1.2299440	1.2299440	0.3	-9.70	90.00	AVRG
1,3-Dichlorobenzene	1.4900000	1.4179503	1.4179503	0.001	-4.84	90.00	AVRG
1,4-Dichlorobenzene	1.6500000	1.5283027	1.5283027	0.001	-7.38	90.00	AVRG
1,2-Dichlorobenzene	1.3150000	1.1820042	1.1820042	0.001	-10.11	90.00	AVRG

units UG/L

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: F50052 Calibration Date: 11/28/02 Time: 1236

Lab File ID: CS021128A52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

GC Column: EQUITY624 ID: 0.53 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dibromo-3-Chloropropane	0.2050000	0.1651099	0.1651099	0.001	-19.46	90.00	AVRG
1,2,4-Trichlorobenzene	0.7740000	0.6732135	0.6732135	0.001	-13.02	90.00	AVRG
Xylene (total)	0.5750000	0.5692048	0.5692048	0.001	-1.01	90.00	AVRG
Methyl acetate ✓	0.2600000	0.1871429	0.1871429	0.001	-28.02	90.00	AVRG
Cyclohexane	0.5620000	0.5952680	0.5952680	0.001	5.92	90.00	AVRG
Methylcyclohexane	0.5140000	0.5335813	0.5335813	0.001	3.81	90.00	AVRG
Dibromofluoromethane	0.6370000	0.6519355	0.6519355	0.001	2.34	90.00	AVRG
1,2-Dichloroethane-d4	0.2650000	0.2863534	0.2863534	0.001	8.06	90.00	AVRG
Toluene-d8	1.2490000	1.2585834	1.2585834	0.001	0.77	90.00	AVRG
Bromofluorobenzene	1.8100000	1.6722638	1.6722638	0.001	-7.61	90.00	AVRG

DJC

JJ

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP59 Calibration Date: 11/29/02 Time: 1124

Lab File ID: GS021129A59 Init. Calib. Date(s): 11/28/02 11/28/02

Init. Calib. Times: 1512 1719

GC Column: ZB624 ID: 0.32 (mm)

pr2M

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.5820000	0.6111191	0.6111191	0.001	5.00	90.00	AVRG
Chloromethane	0.3800000	0.3607252	0.3607252	0.1	-5.07	90.00	AVRG
Vinyl Chloride	0.3110000	0.3414881	0.3414881	0.001	9.80	20.00	AVRG
Bromomethane	0.2850000	0.2401175	0.2401175	0.001	-15.75	90.00	AVRG
Chloroethane	0.1360000	0.1652458	0.1652458	0.001	21.50	90.00	AVRG
Trichlorofluoromethane	0.6230000	0.6812282	0.6812282	0.001	9.35	90.00	AVRG
1,1-Dichloroethene	0.2520000	0.2827589	0.2827589	0.001	12.20	20.00	AVRG
Carbon disulfide	0.9800000	1.0833663	1.0833663	0.001	10.55	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	285.41546	250.00000	0.4856477	0.001	14.17	90.00	2RDR
Acetone	810.77406	625.00000	0.0403208	0.001	29.72	90.00	2RDR
Methylene Chloride	308.59051	250.00000	0.2998829	0.001	23.44	90.00	2RDR
trans-1,2-Dichloroethene	0.2660000	0.3033509	0.3033509	0.001	14.04	90.00	AVRG
Methyl-tert-butyl ether	0.4140000	0.4551696	0.4551696	0.001	9.94	90.00	AVRG
1,1-Dichloroethane	0.4760000	0.5220003	0.5220003	0.1	9.66	90.00	AVRG
cis-1,2-Dichloroethene	0.2620000	0.3059260	0.3059260	0.001	16.76	90.00	AVRG
2-butanone	0.0520000	0.0560064	0.0560064	0.001	7.70	90.00	AVRG
Chloroform	0.5460000	0.5929673	0.5929673	0.001	8.60	20.00	AVRG
1,1,1-Trichloroethane	0.4800000	0.5193059	0.5193059	0.001	8.19	90.00	AVRG
Carbon Tetrachloride	0.4170000	0.4601344	0.4601344	0.001	10.34	90.00	AVRG
Benzene	0.7700000	0.8616730	0.8616730	0.001	11.90	90.00	AVRG
1,2-Dichloroethane	0.3550000	0.3776007	0.3776007	0.001	6.37	90.00	AVRG
Trichloroethene	0.2060000	0.2345153	0.2345153	0.001	13.84	90.00	AVRG
1,2-Dichloropropane	0.2100000	0.2401765	0.2401765	0.001	14.37	20.00	AVRG
Bromodichloromethane	0.3630000	0.4117265	0.4117265	0.001	13.42	90.00	AVRG
cis-1,3-Dichloropropene	0.3240000	0.3772300	0.3772300	0.001	16.43	90.00	AVRG
4-Methyl-2-pentanone	618.28464	625.00000	0.1828781	0.001	-1.07	90.00	2RDR
Toluene	1.0040000	0.9812419	0.9812419	0.001	-2.27	20.00	AVRG
trans-1,3-Dichloropropene	0.4930000	0.5422102	0.5422102	0.001	9.98	90.00	AVRG
1,1,2-Trichloroethane	0.2700000	0.3024512	0.3024512	0.001	12.02	90.00	AVRG
Tetrachloroethene	0.3250000	0.3697033	0.3697033	0.001	13.75	90.00	AVRG
2-hexanone	626.89950	625.00000	0.1222199	0.001	0.30	90.00	2RDR
Dibromochloromethane	0.4080000	0.4521826	0.4521826	0.001	10.83	90.00	AVRG
1,2-Dibromoethane	0.3220000	0.3638890	0.3638890	0.001	13.01	90.00	AVRG
Chlorobenzene	0.8720000	1.0178101	1.0178101	0.3	16.72	90.00	AVRG
Ethylbenzene	0.4230000	0.5067004	0.5067004	0.001	19.79	20.00	AVRG
Styrene	0.8430000	1.0163103	1.0163103	0.001	20.56	90.00	AVRG
Bromoform	276.26020	250.00000	0.2904870	0.1	10.50	90.00	2RDR
Isopropyl Benzene	1.3990000	1.6624579	1.6624579	0.001	18.83	90.00	AVRG
1,1,2,2-Tetrachloroethane	0.6850000	0.7272052	0.7272052	0.3	6.16	90.00	AVRG
1,3-Dichlorobenzene	1.3240000	1.5471545	1.5471545	0.001	16.85	90.00	AVRG
1,4-Dichlorobenzene	1.3660000	1.5672806	1.5672806	0.001	14.74	90.00	AVRG
1,2-Dichlorobenzene	1.1510000	1.3354051	1.3354051	0.001	16.02	90.00	AVRG

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP59 Calibration Date: 11/29/02 Time: 1124

Lab File ID: GS021129A59 Init. Calib. Date(s): 11/28/02 11/28/02

Init. Calib. Times: 1512 1719

GC Column: ZB624 ID: 0.32 (mm)

PREV.

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dibromo-3-Chloropropane	0.0810000	0.1037652	0.1037652	0.001	28.10	90.00	AVRG
1,2,4-Trichlorobenzene	0.6790000	0.8060872	0.8060872	0.001	18.72	90.00	AVRG
Xylene (total)	0.5290000	0.6226696	0.6226696	0.001	17.71	90.00	AVRG
Methyl acetate	0.1030000	0.1052725	0.1052725	0.001	2.21	90.00	AVRG
Cyclohexane	0.3690000	0.4177485	0.4177485	0.001	13.21	90.00	AVRG
Methylcyclohexane	0.3000000	0.3661168	0.3661168	0.001	22.04	90.00	AVRG
Dibromofluoromethane	0.3360000	0.3790174	0.3790174	0.001	12.80	90.00	AVRG
1,2-Dichloroethane-d4	0.2960000	0.3096257	0.3096257	0.001	4.60	90.00	AVRG
Toluene-d8	1.1690000	1.3526094	1.3526094	0.001	15.71	90.00	AVRG
Bromofluorobenzene	1.0230000	1.1122300	1.1122300	0.001	8.72	90.00	AVRG

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Level: (low/med) LOW

	CLIENT SAMPLE NO.	SMC1 (DBF) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	VBLKVQ	102	96	110	94	0
02	VBLKUA	107	105	114	103	0
03	VUALCS	78	82	86	82	0
04	VVQLCS	107	118	117	92	0
05	40SB10A	109	115	110	97	0
06	40SB10F	117	124	109	98	0
07	40SB7C	113	114	119	106	0
08	40SB10B	105	113	101	92	0
09	VBLKUB	100	99	106	87	0
10	VUBLCS	90	93	97	82	0
11	40SB10C	86	83	94	77	0
12	40SB8C	85	90	93	81	0
13	40SB7F	106	118	126*	144*	2
14	40SB7B	80	85	77	73	0
15	D-2	116	123	112	109	0
16	40SB6A	121	111	139*	101	1
17	40SB6F	122	124	129*	128	1
18	40SB7FRE	142*	154*	128*	120	3
19	40SB7A	85	92	85	75	0
20	40SB6C	94	98	100	90	0
21	VBLKUC	95	103	93	94	0
22	VUCLCS	93	105	92	82	0
23	VBLKVT	106	102	114	112	0
24	D-3	251*	294*	198*	199*	4
25	VTLLCS	76	81	78	76	0
26	40SB4B	242*	280*	172*	168*	4
27	40SB4C	237*	268*	169*	163*	4
28	D-4	323*	364*	215*	208*	4

		QC LIMITS
SMC1 (DBF)	= Dibromofluoromethane	(71-141)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(70-139)
SMC3 (TOL)	= Toluene-d8	(72-123)
SMC4 (BFB)	= Bromofluorobenzene	(65-131)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Level: (low/med) LOW

	CLIENT SAMPLE NO.	SMC1 (DBF) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	40SB3A	302*	348*	203*	197*	4
02	40SB3B	279*	316*	181*	172*	4
03	D-2RE	93	96	112	122	0
04	40SB6ARE	88	86	99	104	0
05	40SB3C	274*	308*	176*	165*	4
06	40SB6FRE	89	90	97	114	0
07	40SB3BMS	79	94	74	70	0
08	40SB6CRE	92	90	96	100	0
09	40SB3BMSD	77	94	73	69	0
10	VBLKVX	109	99	105	101	0
11	VVXLCS	106	98	111	101	0
12	40SB4BRE	86	82	89	86	0
13	40SB4CRE	89	83	90	85	0
14	D-4RE	92	85	95	88	0
15	40SB3ARE	87	89	84	84	0
16	40SB3BRE	94	92	94	88	0
17	40SB3CRE	94	92	95	90	0
18						
19						
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28						

		QC LIMITS
SMC1 (DBF)	= Dibromofluoromethane	(71-141)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(70-139)
SMC3 (TOL)	= Toluene-d8	(72-123)
SMC4 (BFB)	= Bromofluorobenzene	(65-131)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 3
SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix Spike - Sample No.: 40SB3B Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	130	0.00	75	58	50-150
Chloromethane	130	0.00	81	62	50-150
Vinyl Chloride	130	0.00	99	76	50-150
Bromomethane	130	0.00	100	77	50-150
Chloroethane	130	0.00	120	92	50-150
Trichlorofluoromethane	130	5.8	110	80	50-150
1,1-Dichloroethene	130	0.00	120	92	50-150
Carbon disulfide	130	0.00	110	85	50-150
1,1,2-trichloro-1,2,2-t	130	11	110	76	50-150
Acetone	340	250	410	47*	50-150
Methylene Chloride	130	12	120	83	50-150
trans-1,2-Dichloroethen	130	0.00	110	85	50-150
Methyl-tert-butyl ether	130	0.00	120	92	50-150
1,1-Dichloroethane	130	0.00	100	77	50-150
cis-1,2-Dichloroethene	130	0.00	110	85	50-150
2-butanone	340	0.00	340	100	50-150
Chloroform	130	0.00	120	92	50-150
1,1,1-Trichloroethane	130	0.00	120	92	50-150
Carbon Tetrachloride	130	0.00	120	92	50-150
Benzene	130	0.00	110	85	50-150
1,2-Dichloroethane	130	0.00	130	100	50-150
Trichloroethene	130	21	110	68	50-150
1,2-Dichloropropane	130	0.00	120	92	50-150
Bromodichloromethane	130	0.00	120	92	50-150
cis-1,3-Dichloropropene	130	0.00	110	85	50-150
4-Methyl-2-pentanone	340	12	390	110	50-150
Toluene	130	12	100	68	50-150
trans-1,3-Dichloroprope	130	0.00	110	85	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Lab File ID (Standard): CU021127A61 Date Analyzed: 11/27/02

Instrument ID: 5973HP61 Time Analyzed: 1017

GC Column: RTX-VMS ID: 0.18 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	343979	2.61	239423	3.86	164034	4.94
	UPPER LIMIT	687958	3.11	478846	4.36	328068	5.44
	LOWER LIMIT	171990	2.11	119712	3.36	82017	4.44
	CLIENT SAMPLE NO.						
01	VBLKUB	317579	2.61	215663	3.86	120449	4.94
02	VUBLCS	315630	2.61	242429	3.86	159533	4.94
03	40SB10C	281183	2.61	173344	3.86	90901	4.94
04	40SB8C	296570	2.61	179115	3.86	92214	4.94
05	40SB7F RE2	-52% 164826*	2.61	-49% 73699*	3.86	-85% 24369*	4.95
06	40SB7B	258668	2.61	170532	3.86	95197	4.94
07	D-2 [redacted] use	208857	2.61	122408	3.86	-69% 49561*	4.94
08	40SB6A Do not use	140640*	2.61	-75% 58167*	3.87	-91% 13936*	4.95
09	40SB6F Do not use	174572	2.61	85275*	3.86	29061*	4.95
10	40SB7FRE Do not	-56% 148766*	2.61	-70 71350*	3.87	-86 22533*	4.95
11	40SB7A	274948	2.61	178122	3.86	93842	4.94
12	40SB6C [redacted] use	256189	2.61	152862	3.86	-56% 71250*	4.94
13							
14							
15							
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19							
20							

-70% R

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Lab File ID (Standard): CS021128A52 Date Analyzed: 11/28/02

Instrument ID: F50052 Time Analyzed: 1236

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	1676991	10.63	1370618	13.92	739241	15.76
	UPPER LIMIT	3353982	11.13	2741236	14.42	1478482	16.26
	LOWER LIMIT	838496	10.13	685309	13.42	369620	15.26
	CLIENT SAMPLE NO.						
01	VBLKUC	1660893	10.63	1395853	13.94	697633	15.77
02	VUCLCS	1616724	10.63	1329511	13.94	710695	15.77
03	VD-3 Do not use	547445*	10.65	414825*	13.94	131963*	15.77
04	40SB4B use	-59675083*	10.63	748007	13.92	378588	15.77
05	40SB4C use	-59672688*	10.63	745765	13.92	386110	15.76
06	VD-4 Do not use	505656*	10.65	589308*	13.94	307371*	15.77
07	40SB3A Do not use	545037*	10.65	618976*	13.94	300200*	15.77
08	40SB3B use	-63604093*	10.65	712216	13.94	371188	15.77
09	40SB3C use	-63609748*	10.63	739909	13.92	389882	15.76
10	40SB3BMS	1947484	10.63	1617121	13.92	818219	15.76
11	40SB3BMSD	1860726	10.63	1543620	13.92	786617	15.76
12							
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18							
19							
20							

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Lab File ID (Standard): CU021128B59 Date Analyzed: 11/28/02

Instrument ID: 5972HP59 Time Analyzed: 1603

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	588967	8.99	344591	12.47	180922	14.47
	UPPER LIMIT	1177934	9.49	689182	12.97	361844	14.97
	LOWER LIMIT	294484	8.49	172296	11.97	90461	13.97
	CLIENT SAMPLE NO.						
01	VBLKVT	727713	8.98	410150	12.46	187354	14.47
02	VTLLCS	693528	8.98	414715	12.46	206825	14.46
03	D-2RE Do not use	599511	8.99	248331	12.47	63170*	14.47
04	40SB6ARE use	592469	8.99	305383	12.47	121000	14.47
05	40SB6FRE use	516972	8.98	266502	12.47	98257	14.46
06	40SB6CRE use	558055	8.99	290790	12.47	113820	14.47
07	Do not use						
08							
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IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Lab File ID (Standard): CS021129A59 Date Analyzed: 11/29/02

Instrument ID: 5972HP59 Time Analyzed: 1124

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) N

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	712218	8.99	444075	12.47	224931	14.47
	UPPER LIMIT	1424436	9.49	888150	12.97	449862	14.97
	LOWER LIMIT	356109	8.49	222038	11.97	112466	13.97
	CLIENT SAMPLE NO.						
01	VBLKVU	750590	9.00	444237	12.48	209227	14.48
02	VVULCS	762322	8.99	458615	12.47	231961	14.47
03	VD-3REuse	830934	9.00	495722	12.49	247235	14.48
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IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Lab File ID (Standard): GS021129A59 Date Analyzed: 11/29/02

Instrument ID: 5972HP59 Time Analyzed: 1124

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	712218	8.99	444075	12.47	224931	14.47
	UPPER LIMIT	1424436	9.49	888150	12.97	449862	14.97
	LOWER LIMIT	356109	8.49	222038	11.97	112466	13.97
	CLIENT SAMPLE NO.						
01	VBLKVX	611934	8.99	374266	12.48	181657	14.48
02	VVXLCS	740874	8.99	457280	12.47	236860	14.47
03	40SB4BRE Do not use	921249	9.00	543312	12.49	244041	14.48
04	40SB4CRE Do not use	857779	9.01	518412	12.49	250147	14.48
05	D-4RE use.	808563	9.00	476627	12.49	231041	14.48
06	40SB3ARE use	787763	9.01	443273	12.49	194180	14.48
07	40SB3BRE Do not use	665989	9.00	391942	12.49	181928	14.48
08	40SB3CRE Do not use	845627	9.01	488105	12.49	234256	14.48
09							
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IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 2/18/03
DV Level: II (III) IV
Review Document:
_X_ NFG - Region III Modifications
_X_ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: S2788
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

collected	Extracted	Analyzed
11/13/02	11/23/02	11/26/02
"	11/16/02	11/20/02, 11/22/02
11/14/02	11/18/02	11/19/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ( ); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes: CC 1112/02 0856 atrazine -58.9 ND → R, C
attached

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		/
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?	✓		✓
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)	✓		✓
	1 or more <10% / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high Positives: L / J / L / K Non-detects: R / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached
MS | MSD > QC and ND in parent 405B3B no action

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: see attached
Pos → J

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

74.5 ~~150~~ 86.5

10.0 Field Duplicate

		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

405B4C	D-4	% RPD
bis(2-ethylhexyl)phthalate	83	86	30% OK
Di-n-Octyl ph	500U	210	OK

405B75	D-2	% RPD
n-nitrosodi-	1400	1300	7% OK
Phenanthrene	34J	450U	OK
Di-n-butPh-	100	73	31% OK
bis(2-eth)	1800	2700	40% comment

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification

		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).			
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?			
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			

Notes:

TIC → NJ1 ~~t~~

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)			
12.1.1	Number of samples: 20			
12.1.2	Number of target compounds in each analysis: 65			
12.1.3	Number of results rejected and not reported: 9			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 96%			

Notes:

~~2350~~

3332

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date(s): 11/07/02 11/07/02

Column: ID: 0.00 (mm) Calibration Time(s): 1136 1432

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Benzaldehyde	AVRG	1.30274490	17.843	50.000
Phenol	AVRG	1.89772952	14.412	30.000
Bis(2-chloroethyl)ether	AVRG	1.70855836	17.883	50.000
2-Chlorophenol	AVRG	1.42767624	11.067	50.000
2-Methylphenol	AVRG	1.38385997	14.848	50.000
2,2'-oxybis(1-Chloropropane)	AVRG	2.26955619	28.290	50.000
Acetophenone	AVRG	2.24511262	11.534	50.000
4-Methylphenol	AVRG	1.31694907	21.060	50.000
N-Nitroso-di-N-propylamine	AVRG	1.02388610	17.495	50.000
Hexachloroethane	AVRG	0.65768903	17.691	50.000
Nitrobenzene	AVRG	0.49424158	12.840	50.000
Isophorone	AVRG	0.86333819	5.273	50.000
2-Nitrophenol	AVRG	0.22874976	4.131	30.000
2,4-Dimethylphenol	AVRG	0.29036084	10.350	50.000
Bis(2-chloroethoxy)methane	AVRG	0.51766496	14.117	50.000
2,4-Dichlorophenol	AVRG	0.30415530	9.875	30.000
Naphthalene	AVRG	1.00744559	15.336	50.000
4-Chloroaniline	AVRG	0.49164580	12.444	50.000
Hexachlorobutadiene	AVRG	0.21210074	11.494	30.000
Caprolactam	AVRG	0.16108307	6.234	50.000
4-Chloro-3-methylphenol	AVRG	0.34308590	15.332	30.000
2-Methylnaphthalene	AVRG	0.66917294	16.097	50.000
Hexachlorocyclopentadiene	AVRG	0.39707275	8.476	50.000
2,4,6-Trichlorophenol	AVRG	0.46099466	14.822	30.000
2,4,5-Trichlorophenol	AVRG	0.54672600	15.253	50.000
1,1'-Biphenyl	AVRG	1.41212336	6.435	50.000
2-Chloronaphthalene	AVRG	1.06227993	14.872	50.000
2-Nitroaniline	AVRG	0.54374147	14.279	50.000
Dimethylphthalate	AVRG	1.55784112	15.768	50.000
2,6-Dinitrotoluene	AVRG	0.35192001	11.110	50.000
Acenaphthylene	AVRG	1.98732162	22.266	50.000
3-Nitroaniline	AVRG	0.37739775	9.590	50.000
Acenaphthene	AVRG	1.14340489	24.399	30.000
2,4-Dinitrophenol	AVRG	0.21014182	13.366	50.000
4-Nitrophenol	AVRG	0.29561108	13.352	50.000
2,4-Dinitrotoluene	AVRG	0.49249320	10.422	50.000
Dibenzofuran	AVRG	1.70152915	20.994	50.000
Diethylphthalate	AVRG	1.46943798	11.427	50.000
4-Chlorophenyl-phenylether	AVRG	0.62257129	13.017	50.000
Fluorene	AVRG	1.22227487	18.557	50.000
4-Nitroaniline	AVRG	0.40558873	9.844	50.000
4,6-Dinitro-2-methylphenol	AVRG	0.18108206	17.302	50.000
N-Nitrosodiphenylamine	AVRG	0.43337702	24.984	30.000
4-Bromophenyl-phenylether	AVRG	0.22905383	15.788	50.000

JJV

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date(s): 11/07/02 11/07/02

Column: ID: 0.00 (mm) Calibration Time(s): 1136 1432

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Hexachlorobenzene	AVRG	0.25802471	11.592	50.000
Atrazine	AVRG	0.14249846	57.888	50.000
Pentachlorophenol	AVRG	0.17358015	15.876	30.000
Phenanthrene	AVRG	1.14457079	16.162	50.000
Anthracene	AVRG	1.17007834	15.758	50.000
Carbazole	AVRG	1.02103502	15.471	50.000
Di-n-butylphthalate	AVRG	1.60006539	13.559	50.000
Fluoranthene	AVRG	1.23918214	12.665	30.000
Pyrene	AVRG	1.48312678	12.989	50.000
Butylbenzylphthalate	AVRG	0.81574757	12.835	50.000
3,3'-Dichlorobenzidine	AVRG	0.40469248	16.429	50.000
bis(2-ethylhexyl)Phthalate	AVRG	1.11348579	14.270	50.000
Benzo(a)anthracene	AVRG	1.30138787	10.948	50.000
Chrysene	AVRG	1.13203135	16.507	50.000
Di-n-octylphthalate	AVRG	2.49352026	14.269	30.000
Benzo(b)fluoranthene	AVRG	1.78990242	6.511	50.000
Benzo(k)fluoranthene	AVRG	1.65203991	23.605	50.000
Benzo(a)pyrene	AVRG	1.46565601	12.241	30.000
Indeno(1,2,3-cd)pyrene	AVRG	1.37879157	11.869	50.000
Dibenzo(a,h)anthracene	AVRG	1.26812413	16.930	50.000
Benzo(g,h,i)perylene	AVRG	1.32820866	13.834	50.000
2-Fluorophenol	AVRG	1.85599370	3.533	50.000
Phenol-d5	AVRG	2.07305220	12.044	50.000
Nitrobenzene-d5	AVRG	0.54999573	9.750	50.000
2-Fluorobiphenyl	AVRG	1.40167410	20.101	50.000
2,4,6-Tribromophenol	AVRG	0.30417964	7.601	50.000
Terphenyl-d14	AVRG	0.95927827	11.890	50.000

Average %RSD test result.

Calculate Average %RSD: 14.35896301
Maximum Average %RSD: 15.00000000

Note: Passes Average %RSD Test.

FORM VI SV

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date(s): 11/25/02 11/25/02

Column: RTX-5MS ID: 0.32 (mm) Calibration Time(s): 2041 2337

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Benzaldehyde	AVRG	1.13360798	18.776	50.000
Phenol	AVRG	1.61419381	10.437	30.000
Bis(2-chloroethyl)ether	AVRG	1.42279476	5.394	50.000
2-Chlorophenol	AVRG	1.32017786	5.673	50.000
2-Methylphenol	AVRG	1.35086999	10.127	50.000
2,2'-oxybis(1-Chloropropane)	AVRG	1.80136619	12.147	50.000
Acetophenone	AVRG	2.11766249	6.745	50.000
4-Methylphenol	AVRG	1.25831343	7.448	50.000
N-Nitroso-di-N-propylamine	AVRG	0.98072155	14.875	50.000
Hexachloroethane	AVRG	0.69301907	8.122	50.000
Nitrobenzene	AVRG	0.46992312	7.948	50.000
Isophorone	AVRG	0.80071477	4.460	50.000
2-Nitrophenol	AVRG	0.23220109	11.639	30.000
2,4-Dimethylphenol	AVRG	0.30596015	17.405	50.000
Bis(2-chloroethoxy)methane	AVRG	0.48218882	3.944	50.000
2,4-Dichlorophenol	AVRG	0.33477862	7.280	30.000
Naphthalene	AVRG	1.07954606	6.261	50.000
4-Chloroaniline	AVRG	0.49471199	5.176	50.000
Hexachlorobutadiene	AVRG	0.28158775	10.441	30.000
Caprolactam	AVRG	0.13579129	5.560	50.000
4-Chloro-3-methylphenol	AVRG	0.35560183	7.474	30.000
2-Methylnaphthalene	AVRG	0.79120021	11.071	50.000
Hexachlorocyclopentadiene	AVRG	0.44372014	17.611	50.000
2,4,6-Trichlorophenol	AVRG	0.44394950	10.060	30.000
2,4,5-Trichlorophenol	AVRG	0.50353440	12.902	50.000
1,1'-Biphenyl	AVRG	1.35796936	13.136	50.000
2-Chloronaphthalene	AVRG	0.99563885	11.264	50.000
2-Nitroaniline	AVRG	0.47461553	11.023	50.000
Dimethylphthalate	AVRG	1.40972693	14.700	50.000
2,6-Dinitrotoluene	AVRG	0.33539014	8.229	50.000
Acenaphthylene	AVRG	1.73675078	12.676	50.000
3-Nitroaniline	AVRG	0.34294245	8.665	50.000
Acenaphthene	AVRG	1.03570200	13.301	30.000
2,4-Dinitrophenol	AVRG	0.21159915	12.847	50.000
4-Nitrophenol	AVRG	0.31841348	14.689	50.000
2,4-Dinitrotoluene	AVRG	0.45746846	9.658	50.000
Dibenzofuran	AVRG	1.72116431	14.031	50.000
Diethylphthalate	AVRG	1.43888496	8.264	50.000
4-Chlorophenyl-phenylether	AVRG	0.68523536	18.722	50.000
Fluorene	AVRG	1.28222397	12.940	50.000
4-Nitroaniline	AVRG	0.35790926	13.788	50.000
4,6-Dinitro-2-methylphenol	AVRG	0.18420774	12.173	50.000
N-Nitrosodiphenylamine	AVRG	0.53755439	15.842	30.000
4-Bromophenyl-phenylether	AVRG	0.28145110	6.424	50.000

JIV

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date(s): 11/25/02 11/25/02

Column: RTX-5MS ID: 0.32 (mm) Calibration Time(s): 2041 2337

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Hexachlorobenzene	AVRG	0.33354824	5.544	50.000
Atrazine	AVRG	0.13583776	69.746	50.000
Pentachlorophenol	AVRG	0.19474831	8.878	30.000
Phenanthrene	AVRG	1.17623288	7.801	50.000
Anthracene	AVRG	1.16871125	7.327	50.000
Carbazole	AVRG	1.04779295	9.078	50.000
Di-n-butylphthalate	AVRG	1.47285411	7.421	50.000
Fluoranthene	AVRG	1.34664335	6.073	30.000
Pyrene	AVRG	1.38506027	5.285	50.000
Butylbenzylphthalate	AVRG	0.68635712	5.722	50.000
3,3'-Dichlorobenzidine	AVRG	0.44742820	6.631	50.000
bis(2-ethylhexyl)Phthalate	AVRG	0.88166660	4.730	50.000
Benzo(a)anthracene	AVRG	1.29223432	4.680	50.000
Chrysene	AVRG	1.12418713	6.775	50.000
Di-n-octylphthalate	AVRG	2.12802595	3.080	30.000
Benzo(b)fluoranthene	AVRG	1.79263450	12.079	50.000
Benzo(k)fluoranthene	AVRG	1.73055574	14.984	50.000
Benzo(a)pyrene	AVRG	1.53613181	5.206	30.000
Indeno(1,2,3-cd)pyrene	AVRG	1.48389065	5.533	50.000
Dibenzo(a,h)anthracene	AVRG	1.40714919	4.582	50.000
Benzo(g,h,i)perylene	AVRG	1.42625822	6.157	50.000
2-Fluorophenol	AVRG	1.58282738	3.090	50.000
Phenol-d5	AVRG	1.81419241	7.581	50.000
Nitrobenzene-d5	AVRG	0.54448082	4.139	50.000
2-Fluorobiphenyl	AVRG	1.37030959	10.437	50.000
2,4,6-Tribromophenol	AVRG	0.37860091	8.911	50.000
Terphenyl-d14	AVRG	1.04946645	3.715	50.000

Average %RSD test result.

Calculate Average %RSD: 9.967387199
Maximum Average %RSD: 15.00000000

Note: Passes Average %RSD Test.

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date: 11/19/02 Time: 0949

Lab File ID: HG021119A64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
N-Nitrosodiphenylamine	0.4340000	0.4662283	0.01	7.42	20.00	AVRG
4-Bromophenyl-phenylether	0.2290000	0.2574964	0.01	12.44	50.00	AVRG
Hexachlorobenzene	0.2580000	0.2899720	0.01	12.39	50.00	AVRG
Atrazine ✓	0.1420000	0.1068013	0.01	-24.79	50.00	AVRG
Pentachlorophenol	0.1740000	0.1884781	0.05	8.32	20.00	AVRG
Phenanthrene	1.1440000	1.1481256	0.01	0.36	50.00	AVRG
Anthracene	1.1700000	1.0954626	0.01	-6.37	50.00	AVRG
Carbazole	1.0210000	1.1142831	0.01	9.14	50.00	AVRG
Di-n-butylphthalate	1.6000000	1.5079943	0.01	-5.75	50.00	AVRG
Fluoranthene	1.2390000	1.2852872	0.01	3.74	20.00	AVRG
Pyrene	1.4830000	1.4462887	0.01	-2.48	50.00	AVRG
Butylbenzylphthalate	0.8160000	0.7568422	0.01	-7.25	50.00	AVRG
3,3'-Dichlorobenzidine ✓	0.4040000	0.5058214	0.01	25.20	50.00	AVRG
bis(2-ethylhexyl)Phthalate	1.1140000	0.9840263	0.01	-11.67	50.00	AVRG
Benzo(a)anthracene	1.3010000	1.3120192	0.01	0.85	50.00	AVRG
Chrysene	1.1320000	1.2087054	0.01	6.78	50.00	AVRG
Di-n-octylphthalate	2.4940000	2.4213762	0.01	-2.91	20.00	AVRG
Benzo(b)fluoranthene ✓	1.7900000	2.1600734	0.01	20.67	50.00	AVRG
Benzo(k)fluoranthene	1.6520000	1.5835043	0.01	-4.15	50.00	AVRG
Benzo(a)pyrene	1.4650000	1.5513766	0.01	5.90	20.00	AVRG
Indeno(1,2,3-cd)pyrene	1.3790000	1.4135096	0.01	2.50	50.00	AVRG
Dibenzo(a,h)anthracene	1.2680000	1.2319552	0.01	-2.84	50.00	AVRG
Benzo(g,h,i)perylene	1.3280000	1.2219623	0.01	-7.98	50.00	AVRG
2-Fluorophenol	1.8560000	1.7396924	0.01	-6.27	50.00	AVRG
Phenol-d5	2.0730000	2.0548569	0.01	-0.88	50.00	AVRG
Nitrobenzene-d5	0.5500000	0.5186644	0.01	-5.70	50.00	AVRG
2-Fluorobiphenyl	1.4020000	1.3258292	0.01	-5.43	50.00	AVRG
2,4,6-Tribromophenol	0.3040000	0.3217718	0.01	5.84	50.00	AVRG
Terphenyl-d14	0.9590000	1.0119551	0.01	5.52	50.00	AVRG

PREV.

NO POS.

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date: 11/20/02 Time: 1939

Lab File ID: HG021120B64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Benzaldehyde	1.3030000	1.2532631	0.01	-3.82	50.00	AVRG
Phenol	1.8980000	1.8312669	0.01	-3.52	20.00	AVRG
Bis(2-chloroethyl)ether	1.7080000	1.6680215	0.01	-2.34	50.00	AVRG
2-Chlorophenol	1.4280000	1.4395779	0.01	0.81	50.00	AVRG
2-Methylphenol	1.3840000	1.4707858	0.01	6.27	50.00	AVRG
2,2'-oxybis(1-Chloropropane)	2.2700000	2.2367039	0.01	-1.47	50.00	AVRG
Acetophenone	2.2450000	2.3225322	0.01	3.45	50.00	AVRG
4-Methylphenol	1.3170000	1.3256542	0.01	0.66	50.00	AVRG
N-Nitroso-di-N-propylamine	1.0240000	0.9786006	0.05	-4.43	50.00	AVRG
Hexachloroethane	0.6580000	0.7062589	0.01	7.33	50.00	AVRG
Nitrobenzene	0.4940000	0.5015165	0.01	1.52	50.00	AVRG
Isophorone	0.8630000	0.8013071	0.01	-7.15	50.00	AVRG
2-Nitrophenol	0.2290000	0.2340150	0.01	2.19	20.00	AVRG
2,4-Dimethylphenol	0.2900000	0.3135460	0.01	8.12	50.00	AVRG
Bis(2-chloroethoxy)methane	0.5180000	0.4756664	0.01	-8.17	50.00	AVRG
2,4-Dichlorophenol	0.3040000	0.3479795	0.01	14.47	20.00	AVRG
Naphthalene	1.0080000	1.1042221	0.01	9.54	50.00	AVRG
4-Chloroaniline	0.4920000	0.4872272	0.01	-0.97	50.00	AVRG
Hexachlorobutadiene	0.2120000	0.2101238	0.01	-0.88	20.00	AVRG
Caprolactam	0.1610000	0.1325079	0.01	-17.70	50.00	AVRG
4-Chloro-3-methylphenol	0.3430000	0.3354835	0.01	-2.19	20.00	AVRG
2-Methylnaphthalene	0.6690000	0.7692107	0.01	14.98	50.00	AVRG
Hexachlorocyclopentadiene	0.3970000	0.4578627	0.05	15.33	50.00	AVRG
2,4,6-Trichlorophenol	0.4610000	0.4434419	0.01	-3.81	20.00	AVRG
2,4,5-Trichlorophenol	0.5470000	0.5224899	0.01	-4.48	50.00	AVRG
1,1'-Biphenyl	1.4120000	1.3841675	0.01	-1.97	50.00	AVRG
2-Chloronaphthalene	1.0620000	1.0313138	0.01	-2.89	50.00	AVRG
2-Nitroaniline	0.5440000	0.5067854	0.01	-6.84	50.00	AVRG
Dimethylphthalate	1.5580000	1.7083786	0.01	9.65	50.00	AVRG
2,6-Dinitrotoluene	0.3520000	0.3302530	0.01	-6.18	50.00	AVRG
Acenaphthylene	1.9870000	1.8921293	0.01	-4.77	50.00	AVRG
3-Nitroaniline	0.3770000	0.3996756	0.01	6.01	50.00	AVRG
Acenaphthene	1.1430000	1.1439886	0.01	0.09	20.00	AVRG
2,4-Dinitrophenol	0.2100000	0.1833750	0.05	-12.68	50.00	AVRG
4-Nitrophenol	0.2960000	0.2814896	0.05	-4.90	50.00	AVRG
2,4-Dinitrotoluene	0.4930000	0.4536542	0.01	-7.98	50.00	AVRG
Dibenzofuran	1.7020000	2.0294234	0.01	19.24	50.00	AVRG
Diethylphthalate	1.4700000	1.5079808	0.01	2.58	50.00	AVRG
4-Chlorophenyl-phenylether ✓	0.6220000	0.7982484	0.01	28.34	50.00	AVRG
Fluorene	1.2220000	1.3565065	0.01	11.01	50.00	AVRG
4-Nitroaniline	0.4060000	0.4159540	0.01	2.45	50.00	AVRG
4,6-Dinitro-2-methylphenol	0.1810000	0.1810163	0.01	0.01	50.00	AVRG

No pos

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date: 11/20/02 Time: 1939

Lab File ID: HG021120B64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
N-Nitrosodiphenylamine	0.4340000	0.4769701	0.01	9.90	20.00	AVRG
4-Bromophenyl-phenylether	0.2290000	0.2710923	0.01	18.38	50.00	AVRG
Hexachlorobenzene	0.2580000	0.2932165	0.01	13.65	50.00	AVRG
Atrazine	0.1420000	0.0976090	0.01	-31.26	50.00	AVRG
Pentachlorophenol	0.1740000	0.1826012	0.05	4.94	20.00	AVRG
Phenanthrene	1.1440000	1.1734309	0.01	2.57	50.00	AVRG
Anthracene	1.1700000	1.1693240	0.01	-0.06	50.00	AVRG
Carbazole	1.0210000	1.1376349	0.01	11.42	50.00	AVRG
Di-n-butylphthalate	1.6000000	1.5378756	0.01	-3.88	50.00	AVRG
Fluoranthene	1.2390000	1.3446425	0.01	8.53	20.00	AVRG
Pyrene	1.4830000	1.3963858	0.01	-5.84	50.00	AVRG
Butylbenzylphthalate	0.8160000	0.7099306	0.01	-13.00	50.00	AVRG
3,3'-Dichlorobenzidine	0.4040000	0.4603033	0.01	13.94	50.00	AVRG
bis(2-ethylhexyl)Phthalate	1.1140000	0.9387217	0.01	-15.73	50.00	AVRG
Benzo(a)anthracene	1.3010000	1.3015918	0.01	0.04	50.00	AVRG
Chrysene	1.1320000	1.1048108	0.01	-2.40	50.00	AVRG
Di-n-octylphthalate	2.4940000	2.2945339	0.01	-8.00	20.00	AVRG
Benzo(b)fluoranthene	1.7900000	1.6137833	0.01	-9.84	50.00	AVRG
Benzo(k)fluoranthene	1.6520000	1.8949329	0.01	14.70	50.00	AVRG
Benzo(a)pyrene	1.4650000	1.5886370	0.01	8.44	20.00	AVRG
Indeno(1,2,3-cd)pyrene	1.3790000	1.3254471	0.01	-3.88	50.00	AVRG
Dibenzo(a,h)anthracene	1.2680000	1.2343335	0.01	-2.66	50.00	AVRG
Benzo(g,h,i)perylene	1.3280000	1.2474302	0.01	-6.07	50.00	AVRG
2-Fluorophenol	1.8560000	1.7983473	0.01	-3.11	50.00	AVRG
Phenol-d5	2.0730000	2.0126422	0.01	-2.91	50.00	AVRG
Nitrobenzene-d5	0.5500000	0.5564918	0.01	1.18	50.00	AVRG
2-Fluorobiphenyl	1.4020000	1.6874468	0.01	20.36	50.00	AVRG
2,4,6-Tribromophenol	0.3040000	0.3795955	0.01	24.87	50.00	AVRG
Terphenyl-d14	0.9590000	0.9777843	0.01	1.96	50.00	AVRG

prev.

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date: 11/22/02 Time: 1019

Lab File ID: HG021122A64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Benzaldehyde	1.3030000	1.1651793	0.01	-10.58	50.00	AVRG
Phenol	1.8980000	1.6293271	0.01	-14.16	20.00	AVRG
Bis(2-chloroethyl)ether	1.7080000	1.4830523	0.01	-13.17	50.00	AVRG
2-Chlorophenol	1.4280000	1.2796261	0.01	-10.39	50.00	AVRG
2-Methylphenol	1.3840000	1.2978379	0.01	-6.22	50.00	AVRG
2,2'-oxybis(1-Chloropropane)	2.2700000	1.8483868	0.01	-18.57	50.00	AVRG
Acetophenone	2.2450000	2.0209822	0.01	-9.98	50.00	AVRG
4-Methylphenol	1.3170000	1.1897913	0.01	-9.66	50.00	AVRG
N-Nitroso-di-N-propylamine	1.0240000	0.9014995	0.05	-11.96	50.00	AVRG
Hexachloroethane	0.6580000	0.6052762	0.01	-8.01	50.00	AVRG
Nitrobenzene	0.4940000	0.4200985	0.01	-14.96	50.00	AVRG
Isophorone	0.8630000	0.7945757	0.01	-7.93	50.00	AVRG
2-Nitrophenol	0.2290000	0.2108121	0.01	-7.94	20.00	AVRG
2,4-Dimethylphenol	0.2900000	0.2533387	0.01	-12.64	50.00	AVRG
Bis(2-chloroethoxy)methane	0.5180000	0.5196087	0.01	0.31	50.00	AVRG
2,4-Dichlorophenol	0.3040000	0.2927753	0.01	-3.69	20.00	AVRG
Naphthalene	1.0080000	0.9373401	0.01	-7.01	50.00	AVRG
4-Chloroaniline	0.4920000	0.5022370	0.01	2.08	50.00	AVRG
Hexachlorobutadiene	0.2120000	0.2385287	0.01	12.51	20.00	AVRG
Caprolactam	0.1610000	0.1428680	0.01	-11.26	50.00	AVRG
4-Chloro-3-methylphenol	0.3430000	0.3036214	0.01	-11.48	20.00	AVRG
2-Methylnaphthalene	0.6690000	0.6698702	0.01	0.13	50.00	AVRG
Hexachlorocyclopentadiene ✓	0.3970000	0.5383160	0.05	35.60	50.00	AVRG
2,4,6-Trichlorophenol	0.4610000	0.4560968	0.01	-1.06	20.00	AVRG
2,4,5-Trichlorophenol	0.5470000	0.5366028	0.01	-1.90	50.00	AVRG
1,1'-Biphenyl	1.4120000	1.2629345	0.01	-10.56	50.00	AVRG
2-Chloronaphthalene	1.0620000	1.0873407	0.01	2.39	50.00	AVRG
2-Nitroaniline	0.5440000	0.4513457	0.01	-17.03	50.00	AVRG
Dimethylphthalate	1.5580000	1.5882111	0.01	1.94	50.00	AVRG
2,6-Dinitrotoluene	0.3520000	0.3343790	0.01	-5.00	50.00	AVRG
Acenaphthylene	1.9870000	1.9614523	0.01	-1.28	50.00	AVRG
3-Nitroaniline	0.3770000	0.4424678	0.01	17.36	50.00	AVRG
Acenaphthene	1.1430000	1.1866482	0.01	3.82	20.00	AVRG
2,4-Dinitrophenol ✓	0.2100000	0.2638169	0.05	25.63	50.00	AVRG
4-Nitrophenol	0.2960000	0.3070832	0.05	3.74	50.00	AVRG
2,4-Dinitrotoluene	0.4930000	0.4776606	0.01	-3.11	50.00	AVRG
Dibenzofuran	1.7020000	1.6887696	0.01	-0.78	50.00	AVRG
Diethylphthalate	1.4700000	1.5803440	0.01	7.51	50.00	AVRG
4-Chlorophenyl-phenylether ✓	0.6220000	0.7626331	0.01	22.61	50.00	AVRG
Fluorene	1.2220000	1.2268635	0.01	0.40	50.00	AVRG
4-Nitroaniline	0.4060000	0.3868582	0.01	-4.71	50.00	AVRG
4,6-Dinitro-2-methylphenol ✓	0.1810000	0.2216393	0.01	22.45	50.00	AVRG

No PDS no Fig

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date: 11/22/02 Time: 1019

Lab File ID: HG021122A64 Init. Calib. Date(s): 11/07/02 11/07/02

Init. Calib. Times: 1136 1432

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
N-Nitrosodiphenylamine	0.4340000	0.4100029	0.01	-5.53	20.00	AVRG
4-Bromophenyl-phenylether	0.2290000	0.2736866	0.01	19.51	50.00	AVRG
Hexachlorobenzene	0.2580000	0.3013021	0.01	16.78	50.00	AVRG
Atrazine	0.1420000	0.0911548	0.01	-35.81	50.00	AVRG
Pentachlorophenol	0.1740000	0.1922813	0.05	10.51	20.00	AVRG
Phenanthrene	1.1440000	1.1671277	0.01	2.02	50.00	AVRG
Anthracene	1.1700000	1.1259649	0.01	-3.76	50.00	AVRG
Carbazole	1.0210000	0.9331461	0.01	-8.60	50.00	AVRG
Di-n-butylphthalate	1.6000000	1.4727600	0.01	-7.95	50.00	AVRG
Fluoranthene	1.2390000	1.3153054	0.01	6.16	20.00	AVRG
Pyrene	1.4830000	1.4293918	0.01	-3.61	50.00	AVRG
Butylbenzylphthalate	0.8160000	0.7352465	0.01	-9.90	50.00	AVRG
3,3'-Dichlorobenzidine	0.4040000	0.3893713	0.01	-3.62	50.00	AVRG
bis(2-ethylhexyl)Phthalate	1.1140000	0.9595809	0.01	-13.86	50.00	AVRG
Benzo(a)anthracene	1.3010000	1.3439369	0.01	3.30	50.00	AVRG
Chrysene	1.1320000	1.1437222	0.01	1.04	50.00	AVRG
Di-n-octylphthalate	2.4940000	2.2503008	0.01	-9.77	20.00	AVRG
Benzo(b)fluoranthene	1.7900000	1.6948337	0.01	-5.32	50.00	AVRG
Benzo(k)fluoranthene	1.6520000	1.7344135	0.01	4.99	50.00	AVRG
Benzo(a)pyrene	1.4650000	1.5486914	0.01	5.71	20.00	AVRG
Indeno(1,2,3-cd)pyrene	1.3790000	1.3566458	0.01	-1.62	50.00	AVRG
Dibenzo(a,h)anthracene	1.2680000	1.2324717	0.01	-2.80	50.00	AVRG
Benzo(g,h,i)perylene	1.3280000	1.2220997	0.01	-7.97	50.00	AVRG
2-Fluorophenol	1.8560000	1.6134351	0.01	-13.07	50.00	AVRG
Phenol-d5	2.0730000	1.8107302	0.01	-12.65	50.00	AVRG
Nitrobenzene-d5	0.5500000	0.5200857	0.01	-5.44	50.00	AVRG
2-Fluorobiphenyl	1.4020000	1.5838940	0.01	12.97	50.00	AVRG
2,4,6-Tribromophenol	0.3040000	0.4043457	0.01	33.01	50.00	AVRG
Terphenyl-d14	0.9590000	1.0816144	0.01	12.78	50.00	AVRG

JJC

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date: 11/26/02 Time: 0856

Lab File ID: HG021126A64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Benzaldehyde	1.1340000	1.0596622	0.01	-6.56	50.00	AVRG
Phenol	1.6140000	1.4767365	0.01	-8.50	20.00	AVRG
Bis(2-chloroethyl)ether	1.4220000	1.3222388	0.01	-7.02	50.00	AVRG
2-Chlorophenol	1.3200000	1.2468891	0.01	-5.54	50.00	AVRG
2-Methylphenol	1.3510000	1.3035700	0.01	-3.51	50.00	AVRG
2,2'-oxybis(1-Chloropropane)	1.8010000	1.6555162	0.01	-8.08	50.00	AVRG
Acetophenone	2.1180000	2.0571741	0.01	-2.87	50.00	AVRG
4-Methylphenol	1.2580000	1.1816644	0.01	-6.07	50.00	AVRG
N-Nitroso-di-N-propylamine	0.9810000	0.8916108	0.05	-9.11	50.00	AVRG
Hexachloroethane	0.6930000	0.6370390	0.01	-8.08	50.00	AVRG
Nitrobenzene	0.4700000	0.3977191	0.01	-15.38	50.00	AVRG
Isophorone	0.8010000	0.7623999	0.01	-4.82	50.00	AVRG
2-Nitrophenol	0.2320000	0.2083348	0.01	-10.20	20.00	AVRG
2,4-Dimethylphenol	0.3060000	0.2791585	0.01	-8.77	50.00	AVRG
Bis(2-chloroethoxy)methane ✓	0.4820000	0.3739481	0.01	-22.42	50.00	AVRG
2,4-Dichlorophenol	0.3350000	0.2939240	0.01	-12.26	20.00	AVRG
Naphthalene	1.0790000	0.8892021	0.01	-17.59	50.00	AVRG
4-Chloroaniline	0.4940000	0.4370357	0.01	-11.53	50.00	AVRG
Hexachlorobutadiene	0.2810000	0.2970701	0.01	5.72	20.00	AVRG
Caprolactam	0.1360000	0.1337569	0.01	-1.65	50.00	AVRG
4-Chloro-3-methylphenol	0.3560000	0.3549068	0.01	-0.31	20.00	AVRG
2-Methylnaphthalene	0.7910000	0.6389904	0.01	-19.22	50.00	AVRG
Hexachlorocyclopentadiene	0.4440000	0.4066597	0.05	-8.41	50.00	AVRG
2,4,6-Trichlorophenol	0.4440000	0.4576498	0.01	3.07	20.00	AVRG
2,4,5-Trichlorophenol	0.5040000	0.5406620	0.01	7.27	50.00	AVRG
1,1'-Biphenyl	1.3580000	1.4328670	0.01	5.51	50.00	AVRG
2-Chloronaphthalene	0.9960000	1.0875001	0.01	9.19	50.00	AVRG
2-Nitroaniline	0.4740000	0.5065754	0.01	6.87	50.00	AVRG
Dimethylphthalate	1.4100000	1.3434372	0.01	-4.72	50.00	AVRG
2,6-Dinitrotoluene	0.3350000	0.3764594	0.01	12.38	50.00	AVRG
Acenaphthylene	1.7360000	1.9540285	0.01	12.56	50.00	AVRG
3-Nitroaniline	0.3430000	0.3215099	0.01	-6.26	50.00	AVRG
Acenaphthene	1.0360000	1.1394751	0.01	9.99	20.00	AVRG
2,4-Dinitrophenol	0.2120000	0.2011818	0.05	-5.10	50.00	AVRG
4-Nitrophenol	0.3180000	0.2987746	0.05	-6.04	50.00	AVRG
2,4-Dinitrotoluene	0.4570000	0.4723868	0.01	3.37	50.00	AVRG
Dibenzofuran	1.7210000	1.5883216	0.01	-7.71	50.00	AVRG
Diethylphthalate	1.4390000	1.3586624	0.01	-5.58	50.00	AVRG
4-Chlorophenyl-phenylether	0.6850000	0.6346775	0.01	-7.35	50.00	AVRG
Fluorene	1.2820000	1.1227403	0.01	-12.42	50.00	AVRG
4-Nitroaniline	0.3580000	0.3838377	0.01	7.22	50.00	AVRG
4,6-Dinitro-2-methylphenol	0.1840000	0.1905946	0.01	3.58	50.00	AVRG

ND 12.1C

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: 5972HP64 Calibration Date: 11/26/02 Time: 0856

Lab File ID: HG021126A64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
N-Nitrosodiphenylamine	0.5380000	0.5823658	0.01	8.25	20.00	AVRG	
4-Bromophenyl-phenylether	0.2810000	0.2550042	0.01	-9.25	50.00	AVRG	
Hexachlorobenzene	0.3340000	0.3009782	0.01	-9.89	50.00	AVRG	
Atrazine	0.1360000	0.0558894	0.01	-58.90	50.00	AVRG	<- ND RIC
Pentachlorophenol	0.1940000	0.1896220	0.05	-2.26	20.00	AVRG	
Phenanthrene	1.1760000	1.1571511	0.01	-1.60	50.00	AVRG	
Anthracene	1.1690000	1.0889483	0.01	-6.85	50.00	AVRG	
Carbazole	1.0480000	1.0285696	0.01	-1.85	50.00	AVRG	
Di-n-butylphthalate	1.4730000	1.3760360	0.01	-6.58	50.00	AVRG	
Fluoranthene	1.3470000	1.2946427	0.01	-3.89	20.00	AVRG	
Pyrene	1.3850000	1.4362652	0.01	3.70	50.00	AVRG	
Butylbenzylphthalate	0.6860000	0.6756096	0.01	-1.51	50.00	AVRG	
3,3'-Dichlorobenzidine	0.4470000	0.4628351	0.01	3.54	50.00	AVRG	
bis(2-ethylhexyl)Phthalate	0.8820000	0.8933309	0.01	1.28	50.00	AVRG	
Benzo(a)anthracene	1.2920000	1.2926500	0.01	0.05	50.00	AVRG	
Chrysene	1.1240000	1.0914227	0.01	-2.90	50.00	AVRG	
Di-n-octylphthalate	2.1280000	2.3083790	0.01	8.48	20.00	AVRG	
Benzo(b)fluoranthene	1.7930000	1.7595449	0.01	-1.86	50.00	AVRG	
Benzo(k)fluoranthene	1.7300000	2.0595509	0.01	19.05	50.00	AVRG	
Benzo(a)pyrene	1.5360000	1.6369495	0.01	6.57	20.00	AVRG	
Indeno(1,2,3-cd)pyrene	1.4840000	1.6008289	0.01	7.87	50.00	AVRG	
Dibenzo(a,h)anthracene	1.4070000	1.4392404	0.01	2.29	50.00	AVRG	
Benzo(g,h,i)perylene	1.4260000	1.3823428	0.01	-3.06	50.00	AVRG	
2-Fluorophenol	1.5830000	1.5354411	0.01	-3.00	50.00	AVRG	
Phenol-d5	1.8140000	1.7066838	0.01	-5.92	50.00	AVRG	
Nitrobenzene-d5	0.5440000	0.4959812	0.01	-8.83	50.00	AVRG	
2-Fluorobiphenyl	1.3700000	1.1975972	0.01	-12.58	50.00	AVRG	
2,4,6-Tribromophenol	0.3780000	0.4298980	0.01	13.73	50.00	AVRG	
Terphenyl-d14	1.0500000	1.0728838	0.01	2.18	50.00	AVRG	

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix Spike - Sample No.: 40SB3B Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Benzaldehyde	4200	0.00	2800	67	10-101
Phenol	4200	0.00	4500	110	35-121
Bis(2-chloroethyl)ether	4200	0.00	2700	64	22-116
2-Chlorophenol	4200	0.00	4300	100	36-116
2-Methylphenol	4200	0.00	3300	79	40-109
2,2'-oxybis(1-Chloropro	4200	0.00	3100	74	28-106
Acetophenone	4200	0.00	2600	62	22-107
4-Methylphenol	8500	0.00	6200	73	10-150
N-Nitroso-di-N-prop.(1)	4200	0.00	4000	95	33-117
Hexachloroethane	4200	0.00	2200	52	12-115
Nitrobenzene	4200	0.00	2700	64	28-117
Isophorone	4200	0.00	3100	74	31-111
2-Nitrophenol	4200	0.00	4400	100	36-117
2,4-Dimethylphenol	4200	0.00	4700	110	26-133
Bis(2-chloroethoxy)meth	4200	0.00	3400	81	44-125
2,4-Dichlorophenol	4200	0.00	4800	110	41-123
Naphthalene	4200	0.00	2900	69	19-112
4-Chloroaniline	4200	0.00	2500	60	10-100
Hexachlorobutadiene	4200	0.00	3400	81	22-122
Caprolactam	4200	0.00	3000	71	10-150
4-Chloro-3-methylphenol	4200	0.00	5600	130*	39-121
2-Methylnaphthalene	4200	0.00	3200	76	20-146
Hexachlorocyclopentadie	4200	0.00	2000	48	10-150
2,4,6-Trichlorophenol	4200	0.00	4700	110	40-137
2,4,5-Trichlorophenol	4200	0.00	3200	76	45-127
1,1'-Biphenyl	4200	0.00	3000	71	30-109
2-Chloronaphthalene	4200	0.00	3000	71	23-131
2-Nitroaniline	4200	0.00	3200	76	22-140

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix Spike - Sample No.: 40SB3B Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzaldehyde	4200	3300	79	16	50	10-101
Phenol	4200	5100	120	12	47	35-121
Bis(2-chloroethyl)ether	4200	2900	69	7	50	22-116
2-Chlorophenol	4200	4800	110	11	43	36-116
2-Methylphenol	4200	3600	86	9	45	40-109
2,2'-oxybis(1-Chloropro	4200	3300	79	6	46	28-106
Acetophenone	4200	2800	67	7	43	22-107
4-Methylphenol	8500	6400	75	3	40	10-150
N-Nitroso-di-N-prop.(1)	4200	3900	93	2	45	33-117
Hexachloroethane	4200	2400	57	9	50	12-115
Nitrobenzene	4200	3000	71	10	43	28-117
Isophorone	4200	3500	83	12	42	31-111
2-Nitrophenol	4200	5000	120*	13	48	36-117
2,4-Dimethylphenol	4200	5700	140*	19	43	26-133
Bis(2-chloroethoxy)meth	4200	3700	88	8	43	44-125
2,4-Dichlorophenol	4200	5400	130*	12	45	41-123
Naphthalene	4200	3200	76	10	37	19-112
4-Chloroaniline	4200	2700	64	8	50	10-100
Hexachlorobutadiene	4200	3900	93	14	46	22-122
Caprolactam	4200	3000	71	0	50	10-150
4-Chloro-3-methylphenol	4200	6100	150*	8	45	39-121
2-Methylnaphthalene	4200	3800	90	17	32	20-146
Hexachlorocyclopentadie	4200	2500	60	22	50	10-150
2,4,6-Trichlorophenol	4200	5100	120	8	44	40-137
2,4,5-Trichlorophenol	4200	3300	79	3	43	45-127
1,1'-Biphenyl	4200	3300	79	10	43	30-109
2-Chloronaphthalene	4200	3100	74	3	41	23-131
2-Nitroaniline	4200	3400	81	6	40	22-140

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

3D
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

SUTLCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Benzaldehyde	2667	943.0	35	10-100
Phenol	2667	4259	160*	23-134
Bis(2-chloroethyl)ether	2667	2757	103	19-113
2-Chlorophenol	2667	3985	149*	20-133
2-Methylphenol	2667	2841	106	21-125
2,2'-oxybis(1-Chloropro	2667	2748	103	18-114
Acetophenone	2667	2456	92	15-110
4-Methylphenol	5333	5365	101*	10-100
N-Nitroso-di-N-prop.(1)	2667	2735	102	12-140
Hexachloroethane	2667	2587	97	10-131
Nitrobenzene	2667	2645	99	18-127
Isophorone	2667	2557	96	21-117
2-Nitrophenol	2667	4414	166*	20-128
2,4-Dimethylphenol	2667	4684	176*	10-133
Bis(2-chloroethoxy)meth	2667	2639	99	22-141
2,4-Dichlorophenol	2667	5098	191*	20-137
Naphthalene	2667	3215	120*	14-113
4-Chloroaniline	2667	2154	81	10-107
Hexachlorobutadiene	2667	2746	103	11-137
Caprolactam	2667	2539	95	13-111
4-Chloro-3-methylphenol	2667	4723	177*	19-137
2-Methylnaphthalene	2667	3590	135	16-146
Hexachlorocyclopentadie	2667	2642	99	10-150
2,4,6-Trichlorophenol	2667	3812	143	21-148
2,4,5-Trichlorophenol	2667	2730	102	20-147
1,1'-Biphenyl	2667	2877	108	20-115
2-Chloronaphthalene	2667	2441	92	15-138
2-Nitroaniline	2667	3272	123	20-132

(1) N-Nitroso-di-n-propylamine
Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

3D
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

SUTLCS

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Dimethylphthalate	2667	2649	99	20-129
2,6-Dinitrotoluene	2667	2940	110	18-131
Acenaphthylene	2667	2538	95	18-121
3-Nitroaniline	2667	3147	118*	11-105
Acenaphthene	2667	2593	97	18-112
2,4-Dinitrophenol	2667	1856	70	10-150
4-Nitrophenol	2667	2991	112	10-145
2,4-Dinitrotoluene	2667	2942	110	18-128
Dibenzofuran	2667	3360	126	24-131
Diethylphthalate	2667	3192	120	18-128
4-Chlorophenyl-phenylet	2667	3437	129	18-130
Fluorene	2667	3481	130*	15-123
4-Nitroaniline	2667	2882	108	10-113
4,6-Dinitro-2-methylphe	2667	2396	90	10-150
N-Nitrosodiphenylamine	2667	3469	130*	23-123
4-Bromophenyl-phenyleth	2667	3061	115	21-131
Hexachlorobenzene	2667	3010	113	15-148
Atrazine	2667	3679	138	10-150
Pentachlorophenol	2667	4482	168*	10-150
Phenanthrene	2667	2783	104	18-123
Anthracene	2667	2744	103	19-120
Carbazole	2667	2979	112	24-140
Di-n-butylphthalate	2667	2587	97	20-131
Fluoranthene	2667	2899	109	16-127
Pyrene	2667	2710	102	12-123
Butylbenzylphthalate	2667	2453	92	20-119
3,3'-Dichlorobenzidine	2667	2099	79	10-129
bis(2-ethylhexyl)Phthal	2667	2428	91	18-125

(1) N-Nitroso-di-n-propylamine
Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 2/12/03
DV Level: II (III) IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: S2788
Test Name: PEST
Method No.: 8081A

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓	✓	
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes: ~~4058B10A, 4058B6A, 4058B7A Not on COCs~~ RA
They are all there!

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Collected	Extracted	Analyzed
11/3/02	11/26/02	12/1/02
11/14/02	〃	11/28/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes: EBs in another SDG.

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		

Notes: See attached
NDs, no flags

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?			
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column? Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.			
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?			
5.4	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			
5.5	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).			
5.6	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).			
5.7	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).			
5.8	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).			

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			
6.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			✓
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
1 out	high/low	No action	No action
2 out	2 high same column	K	No action
	2 low same column	L, UL	No action
	mixed same column	J, UJ	No action
	2 high diff columns	J	Not applicable
	2 low diff columns	J, UJ	Not applicable
	mixed diff columns	Professional judgement	Not applicable
3 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	2 high, 1 low	K (2 high)	J (1 low 2nd column)
	2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
	other mixed	J, UJ	Not applicable
4 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	Mixed	J, UJ	Not applicable

If any recovery is >0% and <10% then L(+)/R(-).

If any recovery is 0% then R(+/-).

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?		✓	✓
	If Yes, J(+) only.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		✓

Notes:

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		✓	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?			

Notes: Several > 40% → J/g

11.0 Pesticide Cleanup Checks (Required when any positive result is reported > 38 ug/Kg for soils)		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)			
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
12.1.4	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness =			

Notes:

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN76 Calibration Date: 11/22/02 Time: 1301

Lab File ID: 067QPNA4NU Init. Calib. Date(s): 11/20/02 11/20/02

Init. Calib. Times: 2112 2347

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1391.3310	1483.1360	0.1	6.60	15.00	AVRG	
Acenaphthene	753.13900	859.42400	0.01	14.11	15.00	AVRG	
Fluorene	5095.9310	5975.8880	0.01	17.27	15.00	AVRG	<-
Pyrene	6010.3720	6191.7600	0.01	3.02	15.00	AVRG	
Phenanthrene	11499.560	12991.984	0.01	12.98	15.00	AVRG	
Anthracene	19419.770	21151.744	0.01	8.92	15.00	AVRG	
Fluoranthene	3925.7720	4423.0400	0.01	12.67	15.00	AVRG	
Chrysene	13266.832	14998.960	0.01	13.06	15.00	AVRG	
Benzo(b)fluoranthene	10085.864	10304.640	0.01	2.17	15.00	AVRG	
Benzo(k)fluoranthene	6798.3840	7589.1200	0.01	11.63	15.00	AVRG	
Dibenzo(a,h)anthracene	2666.3680	2987.3600	0.01	12.04	15.00	AVRG	
Benzo(g,h,i)perylene	3277.7520	3706.7200	0.01	13.09	15.00	AVRG	
Benzo(a)anthracene	8221.2640	9358.6400	0.01	13.83	15.00	AVRG	
Benzo(a)pyrene	8721.4000	9509.2000	0.01	9.03	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7194.0080	7991.6800	0.01	11.09	15.00	AVRG	
Acenaphthylene	1059.2480	1265.1200	0.01	19.44	15.00	AVRG	<-
p-Terphenyl	3948.3150	4398.3840	0.01	11.40	15.00	AVRG	

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN35 Calibration Date: 11/27/02 Time: 1707

Lab File ID: 362YINDAMSR Init. Calib. Date(s): 11/04/02 11/05/02

Init. Calib. Times: 1930 0624

GC Column: CLPEST2 ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1429667.5	1400775.0	0.01	-2.02	15.00	AVRG	
alpha-BHC	1440822.5	1490650.0	0.01	3.46	15.00	AVRG	
beta-BHC	446897.50	456700.00	0.01	2.19	15.00	AVRG	
delta-BHC	1199565.0	1380875.0	0.01	15.11	15.00	AVRG	<-
gamma-BHC (Lindane)	1337300.0	1387275.0	0.01	3.74	15.00	AVRG	
4,4'-DDD	719874.37	736325.00	0.01	2.28	15.00	AVRG	
4,4'-DDE	1088137.5	1049662.5	0.01	-3.54	15.00	AVRG	
4,4'-DDT	480297.08	483716.67	0.01	0.71	15.00	AVRG	
Dieldrin	1184480.0	1122025.0	0.01	-5.27	15.00	AVRG	
Endosulfan I	1090856.2	1037350.0	0.01	-4.90	15.00	AVRG	
Endosulfan II	917724.38	864975.00	0.01	-5.75	15.00	AVRG	
Endosulfan sulfate	580490.00	701281.25	0.01	20.81	15.00	AVRG	<-
Endrin	1056840.0	1004406.2	0.01	-4.96	15.00	AVRG	
Endrin Aldehyde	653961.25	682856.25	0.01	4.42	15.00	AVRG	
Heptachlor	1418778.9	1451325.0	0.01	2.29	15.00	AVRG	
Heptachlor Epoxide	1321115.0	1281450.0	0.01	-3.00	15.00	AVRG	
Methoxychlor	331596.00	336457.50	0.01	1.47	15.00	AVRG	
Toxaphene	56916.250		0.01	-100.00	15.00	AVRG	<-
(2)	58163.250		0.01	-100.00	15.00	AVRG	<-
(3)	42762.000		0.01	-100.00	15.00	AVRG	<-
(4)	65953.500		0.01	-100.00	15.00	AVRG	<-
(5)	40463.250		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	7621.5000	7566.3333	0.01	-0.72	15.00	AVRG	
(2)	10716.033	10305.667	0.01	-3.83	15.00	AVRG	
(3)	27582.600	26719.667	0.01	-3.13	15.00	AVRG	
(4)	13951.033	13306.333	0.01	-4.62	15.00	AVRG	
(5)	7476.0670	7631.3333	0.01	2.08	15.00	AVRG	
Aroclor-1221	1047.7500		0.01	-100.00	15.00	AVRG	<-
(2)	3580.0000		0.01	-100.00	15.00	AVRG	<-
(3)	2580.7500		0.01	-100.00	15.00	AVRG	<-
(4)	10801.250		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	9575.0000		0.01	-100.00	15.00	AVRG	<-
(2)	4631.6670		0.01	-100.00	15.00	AVRG	<-
(3)	11605.667		0.01	-100.00	15.00	AVRG	<-
(4)	2913.0000		0.01	-100.00	15.00	AVRG	<-
(5)	5712.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	7746.0000		0.01	-100.00	15.00	AVRG	<-
(2)	8422.5000		0.01	-100.00	15.00	AVRG	<-
(3)	22455.000		0.01	-100.00	15.00	AVRG	<-
(4)	11549.500		0.01	-100.00	15.00	AVRG	<-
(5)	11545.500		0.01	-100.00	15.00	AVRG	<-

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN35 Calibration Date: 11/28/02 Time: 0119

Lab File ID: 377YINDAMSV Init. Calib. Date(s): 11/04/02 11/05/02

Init. Calib. Times: 1930 0624

GC Column: CLPEST2 ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1429667.5	1427075.0	0.01	-0.18	15.00	AVRG	
alpha-BHC	1440822.5	1489900.0	0.01	3.41	15.00	AVRG	
beta-BHC	446897.50	474025.00	0.01	6.07	15.00	AVRG	
delta-BHC	1199565.0	1412975.0	0.01	17.79	15.00	AVRG	<-
gamma-BHC (Lindane)	1337300.0	1413400.0	0.01	5.69	15.00	AVRG	
4,4'-DDD	719874.37	755868.75	0.01	5.00	15.00	AVRG	
4,4'-DDE	1088137.5	1073475.0	0.01	-1.35	15.00	AVRG	
4,4'-DDT	480297.08	499608.33	0.01	4.02	15.00	AVRG	
Dieldrin	1184480.0	1147212.5	0.01	-3.15	15.00	AVRG	
Endosulfan I	1090856.2	1068650.0	0.01	-2.04	15.00	AVRG	
Endosulfan II	917724.38	893706.25	0.01	-2.62	15.00	AVRG	
Endosulfan sulfate	580490.00	729825.00	0.01	25.72	15.00	AVRG	<-
Endrin	1056840.0	1034475.0	0.01	-2.12	15.00	AVRG	
Endrin Aldehyde	653961.25	696662.50	0.01	6.53	15.00	AVRG	
Heptachlor	1418778.9	1490550.0	0.01	5.06	15.00	AVRG	
Heptachlor Epoxide	1321115.0	1302725.0	0.01	-1.39	15.00	AVRG	
Methoxychlor	331596.00	346717.50	0.01	4.56	15.00	AVRG	
Toxaphene	56916.250		0.01	-100.00	15.00	AVRG	<-
(2)	58163.250		0.01	-100.00	15.00	AVRG	<-
(3)	42762.000		0.01	-100.00	15.00	AVRG	<-
(4)	65953.500		0.01	-100.00	15.00	AVRG	<-
(5)	40463.250		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	7621.5000	7517.6667	0.01	-1.36	15.00	AVRG	
(2)	10716.033	10527.333	0.01	-1.76	15.00	AVRG	
(3)	27582.600	27349.667	0.01	-0.84	15.00	AVRG	
(4)	13951.033	13668.000	0.01	-2.03	15.00	AVRG	
(5)	7476.0670	7875.6667	0.01	5.34	15.00	AVRG	
Aroclor-1221	1047.7500		0.01	-100.00	15.00	AVRG	<-
(2)	3580.0000		0.01	-100.00	15.00	AVRG	<-
(3)	2580.7500		0.01	-100.00	15.00	AVRG	<-
(4)	10801.250		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	9575.0000		0.01	-100.00	15.00	AVRG	<-
(2)	4631.6670		0.01	-100.00	15.00	AVRG	<-
(3)	11605.667		0.01	-100.00	15.00	AVRG	<-
(4)	2913.0000		0.01	-100.00	15.00	AVRG	<-
(5)	5712.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	7746.0000		0.01	-100.00	15.00	AVRG	<-
(2)	8422.5000		0.01	-100.00	15.00	AVRG	<-
(3)	22455.000		0.01	-100.00	15.00	AVRG	<-
(4)	11549.500		0.01	-100.00	15.00	AVRG	<-
(5)	11545.500		0.01	-100.00	15.00	AVRG	<-

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN35 Calibration Date: 11/28/02 Time: 0528

Lab File ID: 385YINDAMSX Init. Calib. Date(s): 11/04/02 11/05/02

Init. Calib. Times: 1930 0624

GC Column: CLPEST2 ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1429667.5	1424900.0	0.01	-0.33	15.00	AVRG	
alpha-BHC	1440822.5	1492275.0	0.01	3.57	15.00	AVRG	
beta-BHC	446897.50	469700.00	0.01	5.10	15.00	AVRG	
delta-BHC	1199565.0	1393100.0	0.01	16.13	15.00	AVRG	<-
gamma-BHC (Lindane)	1337300.0	1407125.0	0.01	5.22	15.00	AVRG	
4,4'-DDD	719874.37	747718.75	0.01	3.87	15.00	AVRG	
4,4'-DDE	1088137.5	1063687.5	0.01	-2.25	15.00	AVRG	
4,4'-DDT	480297.08	488091.67	0.01	1.62	15.00	AVRG	
Dieldrin	1184480.0	1128075.0	0.01	-4.76	15.00	AVRG	
Endosulfan I	1090856.2	1055287.5	0.01	-3.26	15.00	AVRG	
Endosulfan II	917724.38	885231.25	0.01	-3.54	15.00	AVRG	
Endosulfan sulfate	580490.00	719193.75	0.01	23.89	15.00	AVRG	<-
Endrin	1056840.0	1023818.8	0.01	-3.12	15.00	AVRG	
Endrin Aldehyde	653961.25	689625.00	0.01	5.45	15.00	AVRG	
Heptachlor	1418778.9	1473725.0	0.01	3.87	15.00	AVRG	
Heptachlor Epoxide	1321115.0	1296325.0	0.01	-1.88	15.00	AVRG	
Methoxychlor	331596.00	344047.50	0.01	3.76	15.00	AVRG	
Toxaphene	56916.250		0.01	-100.00	15.00	AVRG	<-
(2)	58163.250		0.01	-100.00	15.00	AVRG	<-
(3)	42762.000		0.01	-100.00	15.00	AVRG	<-
(4)	65953.500		0.01	-100.00	15.00	AVRG	<-
(5)	40463.250		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	7621.5000	7625.3333	0.01	0.05	15.00	AVRG	
(2)	10716.033	10453.333	0.01	-2.45	15.00	AVRG	
(3)	27582.600	27185.333	0.01	-1.44	15.00	AVRG	
(4)	13951.033	13636.333	0.01	-2.26	15.00	AVRG	
(5)	7476.0670	7747.0000	0.01	3.62	15.00	AVRG	
Aroclor-1221	1047.7500		0.01	-100.00	15.00	AVRG	<-
(2)	3580.0000		0.01	-100.00	15.00	AVRG	<-
(3)	2580.7500		0.01	-100.00	15.00	AVRG	<-
(4)	10801.250		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	9575.0000		0.01	-100.00	15.00	AVRG	<-
(2)	4631.6670		0.01	-100.00	15.00	AVRG	<-
(3)	11605.667		0.01	-100.00	15.00	AVRG	<-
(4)	2913.0000		0.01	-100.00	15.00	AVRG	<-
(5)	5712.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	7746.0000		0.01	-100.00	15.00	AVRG	<-
(2)	8422.5000		0.01	-100.00	15.00	AVRG	<-
(3)	22455.000		0.01	-100.00	15.00	AVRG	<-
(4)	11549.500		0.01	-100.00	15.00	AVRG	<-
(5)	11545.500		0.01	-100.00	15.00	AVRG	<-

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-1 Date(s) Analyzed: 12/11/02 12/11/02

Instrument ID (1): VARIAN34 Instrument ID (2): VARIAN35

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
4,4'-DDE	1	11.97	11.93	12.07	0.91	
	2	14.66	14.63	14.77	1.8	65.7
alpha-Chlordane	1	11.49	11.46	11.60	3.2	
	2	13.91	13.88	14.02	2.7	16.9
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-18 Date(s) Analyzed: 11/28/02 11/28/02

Instrument ID (1): VARIAN34 Instrument ID (2): VARIAN35

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
gamma-Chlordane	1	11.09	11.02	11.16	0.66	
	2	13.45	13.37	13.51	0.70	5.9
alpha-Chlordane	1	11.50	11.43	11.57	1.4	
	2	13.93	13.85	13.99	0.88	45.6
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

DATA VALIDATION WORKSHEET

PCBs

Reviewer: RA
Date: 2/24/03
DV Level: II III IV

Review Document:

X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: 82788
Test Name: PCB
Method No.: 8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".		✓	
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

collected	extract	analyzed
11/13/02	11/16/02	11/19/02, 12/4/02
11/14/02	11/18/02	4, 11/22/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? 1016 & 1260 require a minimum of three peaks and five concentrations. The remaining arochlors are required to run one standard during calibration.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			

Notes:

5.0 Surrogate Recovery

		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
5.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.4	If No in Section 5.3, are these sample(s) or method blank(s) reanalyzed?			1
5.5	If No in Section 5.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			

	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
	1 out	high/low	No action	No action
	2 out	2 high same column	K	No action
		2 low same column	L, UL	No action
		mixed same column	J, UJ	No action
		2 high diff columns	J	Not applicable
		2 low diff columns	J, UJ	Not applicable
		mixed diff columns	Professional judgement	Not applicable
	3 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		2 high, 1 low	K (2 high)	J (1 low 2nd column)
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
		other mixed	J, UJ	Not applicable
	4 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		Mixed	J, UJ	Not applicable
	If any recovery is >0% and <10% then L(+)/R(-).			
	If any recovery is 0% then R(+/-).			

Notes:

D-3 Tetrachloro-m-xylene 3837 43-135 no action required

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)? Generally, no action is taken on the basis of field duplicate results. Only discussed in the DV report.	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓	✓	

Notes: 405B4C D-4 405B7F D-2
All ND All ND PCB-1254 450 170 RL=62
> QC
comment only

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		✓	
9.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes:

several > 40% → J(+)

Aroclor-1254 "E" in D-3 → J(+)

use DF=5 result

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

2F

SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

GC Column(1): CLPEST ID: 0.53 (mm) GC Column(2): CLPEST2 ID: 0.53 (mm)

	EPA SAMPLE NO.	TCX 1 %REC #	TCX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PBLKUQ	90	78	93	80			0
02	PLCSUQ	89	82	98	82			0
03	40SB7F	58	50	71	141			0
04	40SB8C	80	72	85	71			0
05	40SB7A	78	71	82	72			0
06	40SB6F	81	70	74	70			0
07	40SB10F	79	70	87	71			0
08	40SB10B	63	56	65	56			0
09	40SB10C	76	65	83	72			0
10	40SB7B	86	74	83	73			0
11	40SB7C	56	50	57	50			0
12	40SB6C	81	74	74	63			0
13	PBLKVI	79	68	88	75			0
14	PLCSVI	81	68	89	76			0
15	40SB4B	76	67	69	57			0
16	40SB4C	70	64	63	49			0
17	D-4	74	65	76	62			0
18	40SB3C	68	60	68	55			0
19	D-3	120	383D	61	60			0
20	D-2	120	86	92	90			0
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

ADVISORY QC LIMITS

S1 (TCX) = Tetrachloro-m-xylene (43-135)
S2 (DCB) = Decachlorobiphenyl (43-144)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

10B

PESTICIDE IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

EPA SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-12 Date(s) Analyzed: 11/19/02 11/19/02

Instrument ID (1): VARIAN43 Instrument ID (2): VARIAN46

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	6.93	6.86	7.00	71		
Aroclor-1254	2	7.45	7.38	7.52	84		
	3	8.19	8.12	8.26	68		
COLUMN 1	4						
	5					74	
	1	8.79	8.72	8.86	48		
	2	9.19	9.12	9.26	35		
	3	10.06	10.00	10.14	50		
COLUMN 2	4	10.52	10.46	10.60	52		
	5	11.53	11.47	11.61	110	59	22.6
	1	10.26	10.20	10.34	41		
Aroclor-1260	2	10.86	10.80	10.95	45		
	3	11.37	11.32	11.46	150		
COLUMN 1	4	12.54	12.49	12.63	47		
	5					71	
	1	10.87	10.81	10.95	54		
	2	11.71	11.65	11.79	40		
	3	12.76	12.71	12.85	39		
COLUMN 2	4	13.44	13.38	13.52	47		
	5	14.55	14.49	14.63	45	45	44.8
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

FORM X PEST-2

10B

PESTICIDE IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

EPA SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-6 Date(s) Analyzed: 11/19/02 11/19/02

Instrument ID (1): VARIAN43 Instrument ID (2): VARIAN46

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	6.93	6.86	7.00	66		
Aroclor-1254	2	7.45	7.38	7.52	58		
	3	8.19	8.12	8.26	70		
COLUMN 1	4	9.08	9.01	9.15	110		
	5	9.59	9.54	9.68	140	90	
	1	8.78	8.72	8.86	44		
	2	9.18	9.12	9.26	49		
	3	10.06	10.00	10.14	53		
COLUMN 2	4	10.52	10.46	10.60	59		
	5	11.53	11.47	11.61	78	56	46.6
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

FORM X PEST-2

10B

PESTICIDE IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

EPA SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-5 Date(s) Analyzed: 11/19/02 11/19/02

Instrument ID (1): VARIAN43 Instrument ID (2): VARIAN46

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	6.93	6.86	7.00	110		
Aroclor-1254	2	7.45	7.38	7.52	160		
	3	8.19	8.12	8.26	180		
COLUMN 1	4	9.07	9.01	9.15	350		
	5	9.59	9.54	9.68	540	270	
	1	8.79	8.72	8.86	89		
	2	9.19	9.12	9.26	130		
	3	10.06	10.00	10.14	120		
COLUMN 2	4	10.52	10.46	10.60	110		
	5	11.54	11.47	11.61	220	140	63.4
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

FORM X PEST-2

10B

PESTICIDE IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

EPA SAMPLE NO.

D-2

Lab Name: COMPUCHEM Contract: 8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-10.REJ Date(s) Analyzed: 11/19/02 11/19/02

Instrument ID (1): VARIAN43 Instrument ID (2): VARIAN46

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	6.93	6.86	7.00	140		
Aroclor-1254	2	7.45	7.38	7.52	210		
	3	8.18	8.12	8.26	220		
COLUMN 1	4	9.07	9.01	9.15	270		
	5	9.59	9.54	9.68	330	230	
	1	8.79	8.72	8.86	14		
	2	9.19	9.12	9.26	120		
	3	10.06	10.00	10.14	100		
COLUMN 2	4	10.52	10.46	10.60	140		
	5	11.53	11.47	11.61	110	97	81.3
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

FORM X PEST-2

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: AJ
Date: 02/11/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: S2788
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	X		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: No CoC's in data package

samples from COC 1014: 6A, 6C, 6F, 7A, 7B, 7C, 7F, D-2 received at 1.1°C, below the 2.0°C QC criteria. No action taken

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: see above temperature comment for COC 1014.
Cooler Temps 2.0°C, 2.5°C, 1.1°C, 2.0°C

Sampled: 11/13/02, 11/14/02
extracted: 11/16/02, 11/18/02
analysis: 11/19/02, 11/22/02, 11/21/02, 12/09/02, 11/24/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)			
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".			
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			

Notes: MB : PBLK45 (11/19, 11/22)
PBLKVJ (11/21, 11/26) positive hits for pyrene + Benzo b fluoranthene. Flagged B, Z, all positive results < 5 x blank result.
PBLKYZ (12/09)

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		X	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).		X	
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes: CCV 085PPNA4NH - %D pyrene = 16.48%, benzob flouranthene = 15.34%, acenapthylene = 18.63%, Flagged associated samples J, c
CCV 008QPNA4NO - %D flourene = 16.88%, benzo ghi perylene = 15.39% - No action taken, results ND → over

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? 50-150%		X	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		X	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: %R 40SB7A (1st column run) = 43% - L/UL, s all results
%R 40SB10A (2nd column run) = 24% - L/UL, s all results
%R 40SB7A (2nd column run) = 44% - already flagged from 1st run.

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits? 50-150%		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	X		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: RPD: Napthalene = 28%, Benzo k fluoranthene = 34%. Flagged positives J, d.

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits? 50-150%		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: NO LCSD

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.	X		

Notes: D-2
D-3
D-4

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns. J, 9	X		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: Ø			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			
	% Completeness = 100%			

Notes:

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1013

Project Number	Project Name
09604-258	RFAAP

Project Contact (Name and Phone Number): Darren Rennie

Samplers: Fisher / Spangler

LAB: CO

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explusives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
40SB10A	11/13/02 800	5		X	9	E		4		X	X	X	X	X		X							GEB 11-14-02
40SB10E	810	5		X	9	E		3		X	X		X	X		X							Only received 3 8oz jars
40SB10B	820	5		X	9	E		3		X	X		X	X		X							and received 1 8oz
40SB10C	830	5		X	9	E		3		X	X		X	X		X							without any ID mark
*40SB9A	845	5		X	9	E		4		X	X	X	X	X		X							time! (Blank) CS 11/14/02
40SB9E	855	5		X	9	E		3		X	X		X	X		X							
40SB9C	930	5		X	9	E		3		X	X		X	X		X							
40SB9CMS	950	5		X	9	E		3		X	X		X	X		X							
40SB9CMSD	930	5		X	9	E		3		X	X		X	X		X							

ANALYSES

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Other

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	11/13/02 1800				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 11-14-02 9:00 am	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1014

Project Number	Project Name
07604-258	RFAAP

Project Contact (Name and Phone Number): Darren Rennel

Samplers: Fisher / Spangler

LAB: CC

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405B8A	11/13/02 1000	5		X	9	E		4		X	X	X	X	X		X							
405B8F	1015			X				3		X	X		X	X		X							
405B8C	1030			X				3		X	X		X	X		X							
405B7A	1100			X				4		X	X	X	X	X		X							
405B7F	1120			X				3		X	X		X	X		X							
[redacted]D-2				X				3		X	X		X	X		X							
405B7B	1145			X				3		X	X		X	X		X							
405B7C	1200			X				3		X	X		X	X		X							
405B6A	1400			X				4		X	X	X	X	X		X							
405B6F	1415			X				3		X	X	[redacted]	[redacted]	X		X							PCB for 405B6F
405B6C	1430			X				3		X	X	[redacted]	X	X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	11/13/02 1800				
Relinquished by: [signature]	Date/time 11/13/02	Received by: (for lab) [signature]	Date/Time 11-14-02 9:00	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp = 0°C (1.1°C) CPB 11-14-02

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1100

Project Number	Project Name
07(C7-25	RFKKF

Project Contact (Name and Phone Number): Darren Ranna

Samplers: Fidar Spangler

LAB: 278

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405BSA	11/14/02 845	S		X	9	E		4		X	X	X	X	X		X							
405B5F	11/14/02 900	S		X	9	E		3		X	X	[redacted]	X	X		X							
405B5G	11/14/02 920	S		X	9	E		3		X	X		X	X		X							Light on soil, fell through
405B4A	11/14/02 945	S		X	9	E		4		X	X	X	X	X		X							
405B4F	11/14/02 1000	S		X	9	E		3		X	X		X	X		X							
D-3	11/14/02	S		X	9	E		3		X	X		X	X		X							
405B4B	11/14/02 1045	S		X	9	E		3		X	X		X	X		X							
405B4C	11/14/02 1315	S		X	9	E		3		X	X		X	X		X							
D-4	11/14/02	S		X	9	E		3		X	X		X	X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brad Fowler 11/14/02	1500				
Relinquished by: 11/14/02	Date/time 16:	Received by: (for lab) Maxine J. Bailey	Date/Time 11-15-02 9:00	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1101

Project Number	Project Name
69604258	RFAAP

Project Contact (Name and Phone Number): Darren Rennie

Samplers: Fisher / Spangler

LAB: 279

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405B3A	11/14/02 1445	S		X	9	E		4		X	X	X	X	X		X							
405B3B	11/14/02 1500	S		X	9	E	F	3		X	X	X	X	X		X							
405B3B MS	11/14/02 1500	S		X	9	E	F	3		X	X	X	X	X		X							
405B3B MSD	11/14/02 1500	S		X	9	E	F	3		X	X	X	X	X		X							
405B5C	11/14/02 1530	S		X	9	E		3		X	X		X	X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature] 11/14/02	1800				
[signature] 11/14/02	[illegible]	Received by: (for lab) [signature]	Date/Time 11-15-02 9:00		

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

Temp: 2.5°C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKVJ

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21446-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/18/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	42	U
83-32-9	Acenaphthene	42	U
86-73-7	Fluorene	42	U
129-00-0	Pyrene	12	JP
85-01-8	Phenanthrene	42	U
120-12-7	Anthracene	42	U
206-44-0	Fluoranthene	17	U
218-01-9	Chrysene	8.3	U
205-99-2	Benzo(b)fluoranthene	43	P
207-08-9	Benzo(k)fluoranthene	8.3	U
53-70-3	Dibenzo(a,h)anthracene	8.3	U
191-24-2	Benzo(g,h,i)perylene	8.3	U
56-55-3	Benzo(a)anthracene	8.3	U
50-32-8	Benzo(a)pyrene	8.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	8.3	U
208-96-8	Acenaphthylene	42	U

AMENDED DATA

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN76 Calibration Date: 11/19/02 Time: 0426

Lab File ID: 085PPNA4NH Init. Calib. Date(s): 11/08/02 11/08/02

Init. Calib. Times: 1714 1938

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1244.8370	1431.5200	0.1	15.00	15.00	AVRG	
Acenaphthene	756.34100	834.64000	0.01	10.35	15.00	AVRG	
Fluorene	5088.0190	5558.1760	0.01	9.24	15.00	AVRG	
Pyrene	5033.0920	5862.7200	0.01	16.48	15.00	AVRG	<-
Phenanthrene	11511.222	12600.208	0.01	9.46	15.00	AVRG	
Anthracene	19458.056	20121.520	0.01	3.41	15.00	AVRG	
Fluoranthene	3714.6320	4269.4000	0.01	14.93	15.00	AVRG	
Chrysene	12841.320	14349.360	0.01	11.74	15.00	AVRG	
Benzo(b)fluoranthene	8807.1200	10158.160	0.01	15.34	15.00	AVRG	<-
Benzo(k)fluoranthene	6619.4560	7431.6800	0.01	12.27	15.00	AVRG	
Dibenzo(a,h)anthracene	2626.4240	2899.4400	0.01	10.39	15.00	AVRG	
Benzo(g,h,i)perylene	3345.2320	3748.2400	0.01	12.05	15.00	AVRG	
Benzo(a)anthracene	7967.8640	8924.4000	0.01	12.00	15.00	AVRG	
Benzo(a)pyrene	8522.0240	9338.8000	0.01	9.58	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	6969.4000	7836.5600	0.01	12.44	15.00	AVRG	
Acenaphthylene	1003.3660	1190.3200	0.01	18.63	15.00	AVRG	<-
p-Terphenyl	3786.9580	4218.7520	0.01	11.40	15.00	AVRG	

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN76 Calibration Date: 11/21/02 Time: 0059

Lab File ID: 008QPNA4NO Init. Calib. Date(s): 11/20/02 11/20/02

Init. Calib. Times: 2112 2347

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1391.3310	1497.0240	0.1	7.60	15.00	AVRG	
Acenaphthene	753.13900	821.76000	0.01	9.11	15.00	AVRG	
Fluorene	5095.9310	5956.4160	0.01	16.88	15.00	AVRG	<-
Pyrene	6010.3720	5783.6800	0.01	-3.77	15.00	AVRG	
Phenanthrene	11499.560	12788.384	0.01	11.21	15.00	AVRG	
Anthracene	19419.770	20597.792	0.01	6.07	15.00	AVRG	
Fluoranthene	3925.7720	4162.5200	0.01	6.03	15.00	AVRG	
Chrysene	13266.832	14803.600	0.01	11.58	15.00	AVRG	
Benzo(b)fluoranthene	10085.864	10428.960	0.01	3.40	15.00	AVRG	
Benzo(k)fluoranthene	6798.3840	7589.3600	0.01	11.63	15.00	AVRG	
Dibenzo(a,h)anthracene	2666.3680	2968.2400	0.01	11.32	15.00	AVRG	
Benzo(g,h,i)perylene	3277.7520	3782.2400	0.01	15.39	15.00	AVRG	<-
Benzo(a)anthracene	8221.2640	9156.2400	0.01	11.37	15.00	AVRG	
Benzo(a)pyrene	8721.4000	9515.3600	0.01	9.10	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7194.0080	7974.4000	0.01	10.85	15.00	AVRG	
Acenaphthylene	1059.2480	1208.4480	0.01	14.08	15.00	AVRG	
p-Terphenyl	3948.3150	4319.6160	0.01	9.40	15.00	AVRG	

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN76 Calibration Date: 11/21/02 Time: 0735

Lab File ID: 019QPNA4NP Init. Calib. Date(s): 11/20/02 11/20/02

Init. Calib. Times: 2112 2347

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1391.3310	1421.9840	0.1	2.20	15.00	AVRG	
Acenaphthene	753.13900	843.05600	0.01	11.94	15.00	AVRG	
Fluorene	5095.9310	5725.1680	0.01	12.35	15.00	AVRG	
Pyrene	6010.3720	5993.1200	0.01	-0.29	15.00	AVRG	
Phenanthrene	11499.560	12685.648	0.01	10.31	15.00	AVRG	
Anthracene	19419.770	20421.024	0.01	5.16	15.00	AVRG	
Fluoranthene	3925.7720	4265.5600	0.01	8.66	15.00	AVRG	
Chrysene	13266.832	15043.920	0.01	13.39	15.00	AVRG	
Benzo(b)fluoranthene	10085.864	10557.360	0.01	4.67	15.00	AVRG	
Benzo(k)fluoranthene	6798.3840	7748.0000	0.01	13.97	15.00	AVRG	
Dibenzo(a,h)anthracene	2666.3680	2977.2800	0.01	11.66	15.00	AVRG	
Benzo(g,h,i)perylene	3277.7520	3870.4000	0.01	18.08	15.00	AVRG	<-
Benzo(a)anthracene	8221.2640	9372.0000	0.01	14.00	15.00	AVRG	
Benzo(a)pyrene	8721.4000	9719.4400	0.01	11.44	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7194.0080	8056.8800	0.01	11.99	15.00	AVRG	
Acenaphthylene	1059.2480	1222.2240	0.01	15.39	15.00	AVRG	<-
p-Terphenyl	3948.3150	4433.6000	0.01	12.29	15.00	AVRG	

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN76 Calibration Date: 11/21/02 Time: 1410

Lab File ID: 030QPNA4NQ Init. Calib. Date(s): 11/20/02 11/20/02

Init. Calib. Times: 2112 2347

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1391.3310	1465.7440	0.1	5.35	15.00	AVRG	
Acenaphthene	753.13900	887.05600	0.01	17.78	15.00	AVRG	<-
Fluorene	5095.9310	5778.6720	0.01	13.40	15.00	AVRG	
Pyrene	6010.3720	5868.9600	0.01	-2.35	15.00	AVRG	
Phenanthrene	11499.560	12667.264	0.01	10.15	15.00	AVRG	
Anthracene	19419.770	20656.576	0.01	6.37	15.00	AVRG	
Fluoranthene	3925.7720	4356.9600	0.01	10.98	15.00	AVRG	
Chrysene	13266.832	14618.800	0.01	10.19	15.00	AVRG	
Benzo(b)fluoranthene	10085.864	10316.000	0.01	2.28	15.00	AVRG	
Benzo(k)fluoranthene	6798.3840	7541.6000	0.01	10.93	15.00	AVRG	
Dibenzo(a,h)anthracene	2666.3680	2890.3200	0.01	8.40	15.00	AVRG	
Benzo(g,h,i)perylene	3277.7520	3686.0800	0.01	12.46	15.00	AVRG	
Benzo(a)anthracene	8221.2640	9070.5600	0.01	10.33	15.00	AVRG	
Benzo(a)pyrene	8721.4000	9384.1600	0.01	7.60	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7194.0080	7915.2800	0.01	10.03	15.00	AVRG	
Acenaphthylene	1059.2480	1205.4080	0.01	13.80	15.00	AVRG	
p-Terphenyl	3948.3150	4278.3040	0.01	8.36	15.00	AVRG	

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN76 Calibration Date: 11/22/02 Time: 0958

Lab File ID: 062QPNA4NT Init. Calib. Date(s): 11/20/02 11/20/02

Init. Calib. Times: 2112 2347

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1391.3310	1564.2240	0.1	12.43	15.00	AVRG	
Acenaphthene	753.13900	861.64800	0.01	14.41	15.00	AVRG	
Fluorene	5095.9310	5806.1280	0.01	13.94	15.00	AVRG	
Pyrene	6010.3720	5945.2800	0.01	-1.08	15.00	AVRG	
Phenanthrene	11499.560	12734.592	0.01	10.74	15.00	AVRG	
Anthracene	19419.770	20959.488	0.01	7.93	15.00	AVRG	
Fluoranthene	3925.7720	4308.7600	0.01	9.76	15.00	AVRG	
Chrysene	13266.832	14855.120	0.01	11.97	15.00	AVRG	
Benzo(b)fluoranthene	10085.864	10252.880	0.01	1.66	15.00	AVRG	
Benzo(k)fluoranthene	6798.3840	7504.0800	0.01	10.38	15.00	AVRG	
Dibenzo(a,h)anthracene	2666.3680	2921.2800	0.01	9.56	15.00	AVRG	
Benzo(g,h,i)perylene	3277.7520	3663.6000	0.01	11.77	15.00	AVRG	
Benzo(a)anthracene	8221.2640	9257.5200	0.01	12.60	15.00	AVRG	
Benzo(a)pyrene	8721.4000	9281.9200	0.01	6.43	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7194.0080	7969.8400	0.01	10.78	15.00	AVRG	
Acenaphthylene	1059.2480	1228.6080	0.01	15.99	15.00	AVRG	<-
p-Terphenyl	3948.3150	4359.6320	0.01	10.42	15.00	AVRG	

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN76 Calibration Date: 11/24/02 Time: 0457

Lab File ID: 057RPNA4KG Init. Calib. Date(s): 11/22/02 11/22/02

Init. Calib. Times: 1637 1857

GC Column: PAH-C16 ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1297.1810	1410.6400	0.1	8.75	15.00	AVRG	
Acenaphthene	994.86200	1187.6960	0.01	19.38	15.00	AVRG	<-
Fluorene	5978.2770	6514.5440	0.01	8.97	15.00	AVRG	
Pyrene	5001.8680	5211.0800	0.01	4.18	15.00	AVRG	
Phenanthrene	11615.622	12429.120	0.01	7.00	15.00	AVRG	
Anthracene	20617.435	21849.520	0.01	5.98	15.00	AVRG	
Fluoranthene	3755.1600	3937.4000	0.01	4.85	15.00	AVRG	
Chrysene	21616.152	23205.600	0.01	7.35	15.00	AVRG	
Benzo(b)fluoranthene	7489.7520	8480.6400	0.01	13.23	15.00	AVRG	
Benzo(k)fluoranthene	8607.9600	8624.6400	0.01	0.19	15.00	AVRG	
Dibenzo(a,h)anthracene	2296.6560	2667.3600	0.01	16.14	15.00	AVRG	<-
Benzo(g,h,i)perylene	4111.4880	3875.4400	0.01	-5.74	15.00	AVRG	
Benzo(a)anthracene	21616.152	23205.600	0.01	7.35	15.00	AVRG	
Benzo(a)pyrene	8424.3200	9160.0000	0.01	8.73	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7116.3120	7754.7200	0.01	8.97	15.00	AVRG	
Acenaphthylene	5978.2770	6514.5440	0.01	8.97	15.00	AVRG	
p-Terphenyl	4019.1660	4347.0720	0.01	8.16	15.00	AVRG	

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN76 Calibration Date: 11/24/02 Time: 1209

Lab File ID: 069RPNA4KH Init. Calib. Date(s): 11/22/02 11/22/02

Init. Calib. Times: 1637 1857

GC Column: PAH-C16 ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1297.1810	1431.0080	0.1	10.32	15.00	AVRG	
Acenaphthene ✓	994.86200	1167.7280	0.01	17.38	15.00	AVRG	<-
Fluorene	5978.2770	6473.6800	0.01	8.29	15.00	AVRG	
Pyrene	5001.8680	5323.8000	0.01	6.44	15.00	AVRG	
Phenanthrene	11615.622	12604.944	0.01	8.52	15.00	AVRG	
Anthracene	20617.435	22250.288	0.01	7.92	15.00	AVRG	
Fluoranthene	3755.1600	4053.4400	0.01	7.94	15.00	AVRG	
Chrysene	21616.152	23895.440	0.01	10.54	15.00	AVRG	
Benzo(b)fluoranthene ✓	7489.7520	6167.0400	0.01	-17.66	15.00	AVRG	<-
Benzo(k)fluoranthene ✓	8607.9600	11245.360	0.01	30.64	15.00	AVRG	<-
Dibenzo(a,h)anthracene ✓	2296.6560	2842.3200	0.01	23.76	15.00	AVRG	<-
Benzo(g,h,i)perylene	4111.4880	4185.4400	0.01	1.80	15.00	AVRG	
Benzo(a)anthracene	21616.152	23895.440	0.01	10.54	15.00	AVRG	
Benzo(a)pyrene	8424.3200	9164.0000	0.01	8.78	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7116.3120	7830.4000	0.01	10.03	15.00	AVRG	
Acenaphthylene	5978.2770	6473.6800	0.01	8.29	15.00	AVRG	
p-Terphenyl	4019.1660	4545.4400	0.01	13.09	15.00	AVRG	

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN76 Calibration Date: 11/25/02 Time: 2325

Lab File ID: 022TPNA4JT Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 1147 1411

GC Column: PAH-C16 ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1359.2100	1483.8720	0.1	9.17	15.00	AVRG	
Acenaphthene	1114.8130	1322.1600	0.01	18.60	15.00	AVRG	<-
Fluorene	5848.9810	6630.3040	0.01	13.36	15.00	AVRG	
Pyrene	5061.5320	5540.3200	0.01	9.46	15.00	AVRG	
Phenanthrene	11715.267	12946.176	0.01	10.51	15.00	AVRG	
Anthracene	18899.677	18949.456	0.01	0.26	15.00	AVRG	
Fluoranthene	3948.9320	4281.3200	0.01	8.42	15.00	AVRG	
Chrysene	22229.264	24031.440	0.01	8.11	15.00	AVRG	
Benzo(b)fluoranthene	9491.4240	10260.320	0.01	8.10	15.00	AVRG	
Benzo(k)fluoranthene	7124.1600	7791.9200	0.01	9.37	15.00	AVRG	
Dibenzo(a,h)anthracene	2890.9360	3273.3600	0.01	13.23	15.00	AVRG	
Benzo(g,h,i)perylene	3591.6480	3850.8800	0.01	7.22	15.00	AVRG	
Benzo(a)anthracene	22229.264	24031.440	0.01	8.11	15.00	AVRG	
Benzo(a)pyrene	9077.1760	9750.3200	0.01	7.42	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7822.1760	8481.2800	0.01	8.43	15.00	AVRG	
Acenaphthylene	5848.9810	6630.3040	0.01	13.36	15.00	AVRG	
p-Terphenyl	3941.8880	4303.3760	0.01	9.17	15.00	AVRG	

FORM VII 8310

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN76 Calibration Date: 11/26/02 Time: 0524

Lab File ID: 032TPNA4JU Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 1147 1411

GC Column: PAH-C16 ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1359.2100	1469.4560	0.1	8.11	15.00	AVRG	
Acenaphthene	1114.8130	1268.9920	0.01	13.83	15.00	AVRG	
Fluorene ✓	5848.9810	6754.7520	0.01	15.48	15.00	AVRG	<-
Pyrene	5061.5320	5670.1200	0.01	12.02	15.00	AVRG	
Phenanthrene	11715.267	12742.656	0.01	8.77	15.00	AVRG	
Anthracene	18899.677	19741.216	0.01	4.45	15.00	AVRG	
Fluoranthene	3948.9320	4417.8000	0.01	11.87	15.00	AVRG	
Chrysene	22229.264	25147.440	0.01	13.13	15.00	AVRG	
Benzo(b)fluoranthene	9491.4240	10844.240	0.01	14.25	15.00	AVRG	
Benzo(k)fluoranthene	7124.1600	8109.2000	0.01	13.83	15.00	AVRG	
Dibenzo(a,h)anthracene	2890.9360	3250.1600	0.01	12.42	15.00	AVRG	
Benzo(g,h,i)perylene	3591.6480	3986.9600	0.01	11.01	15.00	AVRG	
Benzo(a)anthracene	22229.264	25147.440	0.01	13.13	15.00	AVRG	
Benzo(a)pyrene	9077.1760	10010.720	0.01	10.28	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7822.1760	8758.5600	0.01	11.97	15.00	AVRG	
Acenaphthylene ✓	5848.9810	6754.7520	0.01	15.48	15.00	AVRG	<-
p-Terphenyl	3941.8880	4480.3520	0.01	13.66	15.00	AVRG	

2F
SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

GC Column(1): LC-PAH ID: 4.60 (mm) GC Column(2): PAH-C16 ID: 4.60 (mm)

	EPA SAMPLE NO.	S1 1 %REC	#	S1 2 %REC	#	S2 1 %REC	#	S2 2 %REC	#	S3 1 %REC	#	S3 2 %REC	#	TOT OUT
01	PBLKUS	80		82										0
02	PLCSUS	88												0
03	40SB10A	54		24*										1
04	40SB10F	91		85										0
05	40SB6C	81		76										0
06	PLCSVJ	96												0
07	40SB3BMS	77												0
08	40SB3BMSD	88												0
09	40SB4B	77		78										0
10	40SB4C	77		73										0
11	D-4	75		69										0
12	40SB3A	120		94										0
13	40SB3B	69		70										0
14	40SB3C	66		68										0
15	PBLKVJ	92		89										0
16	40SB10B	88		118										0
17	40SB8C	1200	D	378D										0
18	40SB7F	140		1170D										0
19	40SB7B	84		148										0
20	D-2	130		974D										0
21	40SB6F	540	D	118										0
22	D-3	1100	D	277D										0
23	40SB10C	61		67										0
24	40SB7A	43	*	44*										2
25	40SB6A	88		87										0
26	40SB7C	85		106										0
27	PLCSXZ	95												0
28	40SB7ARE	150		150*		KLA 12/12/01								1
29	PBLKXZ	99		98										0
30														

ADVISORY
QC LIMITS

S1 = p-Terphenyl (50-150)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Matrix Spike - EPA Sample No.: 40SB3B

COMPOUND	SPIKE ADDED (ug/Kg	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Naphthalene	210	200	95	28*	20	50-150
Acenaphthene	210	160	70	13	20	50-150
Fluorene	420	310	74	14	20	50-150
Pyrene	100	88	88	7	20	50-150
Phenanthrene	210	180	86	12	20	50-150
Anthracene	210	160	76	6	20	50-150
Fluoranthene	100	87	87	6	20	50-150
Chrysene	100	94	94	8	20	50-150
Benzo(b)fluoranthene	53	49	92	11	20	50-150
Benzo(k)fluoranthene	53	62	108	34*	20	50-150
Dibenzo(a,h)anthracene	53	48	90	4	20	50-150
Benzo(g,h,i)perylene	53	47	89	6	20	50-150
Benzo(a)anthracene	53	45	85	2	20	50-150
Benzo(a)pyrene	53	45	85	12	20	50-150
Indeno(1,2,3-cd)pyrene	53	46	87	7	20	50-150
Acenaphthylene	210	120	57	0	20	20-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 2 out of 16 outside limits
Spike Recovery: 0 out of 32 outside limits

COMMENTS: _____

10A
PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.
40SB10A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-1 Date(s) Analyzed: 11/19/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.61	6.95	7.95	26	
	2	9.93	9.83	10.83	22	16.7
Pyrene	1	13.82	13.33	14.33	41	
	2	15.24	14.72	15.72	27	41.2
Phenanthrene	1	11.15	10.62	11.62	23	
	2	13.34	12.82	13.82	24	4.2
Fluoranthene	1	13.05	12.54	13.54	40	
	2	14.70	14.20	15.20	58	36.7
Chrysene	1	16.85	16.41	17.41	94	
	2	16.50	16.00	17.00	11	158.1
Benzo(b)fluoranthene	1	18.64	18.18	19.18	18	
	2	18.05	17.55	18.55	13	32.2
Benzo(k)fluoranthene	1	19.65	19.18	20.18	12	
	2	18.20	17.68	18.68	18	40.0
Benzo(g,h,i)perylene	1	22.89	22.47	23.47	6.0	
	2	20.49	20.01	21.01	10	50.0

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB10A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-1 Date(s) Analyzed: 11/19/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(a)anthracene	1	16.21	15.73	16.73	8.0	
	2	16.50	16.00	17.00	11	31.6
Benzo(a)pyrene	1	20.53	20.06	21.06	19	
	2	18.71	18.21	19.21	11	53.3
Indeno(1,2,3-cd)pyrene	1	23.81	23.43	24.43	9.0	
	2	20.17	19.69	20.69	11	20.0
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB10B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-3 Date(s) Analyzed: 11/22/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.53	8.99	9.99	1500	
	2	10.39	10.36	11.36	22	194.2
Benzo(b)fluoranthene	1	18.95	18.16	19.16	6.7	
	2	17.27	17.00	18.00	18	91.5
Benzo(a)pyrene	1	21.16	20.15	21.15	9.7	
	2	17.97	17.64	18.64	35	113.2
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB10F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-2 Date(s) Analyzed: 11/19/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.93	13.33	14.33	51	
	2	14.80	14.24	15.24	9.4	137.7
Fluoranthene	1	13.10	12.54	13.54	17	
	2	14.29	13.73	14.73	25	38.1
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-18 Date(s) Analyzed: 11/21/02 11/26/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.41	8.99	9.99	38	
	2	10.94	10.83	11.83	47	21.2
Pyrene	1	13.69	13.16	14.16	35	
	2	15.18	14.72	15.72	32	9.0
Phenanthrene	1	10.89	10.38	11.38	18	
	2	13.33	12.82	13.82	22	20.0
Fluoranthene	1	12.90	12.37	13.37	45	
	2	14.65	14.20	15.20	67	39.3
Benzo(b)fluoranthene	1	18.58	18.16	19.16	5.9	
	2	18.10	17.55	18.55	63	165.7
Benzo(k)fluoranthene	1	19.79	19.22	20.22	30	
	2	17.95	17.68	18.68	53	55.4
Dibenzo(a,h)anthracene	1	22.10	21.56	22.56	30	
	2	19.18	18.80	19.80	44	37.8
Benzo(g,h,i)perylene	1	23.19	22.69	23.69	24	
	2	20.60	20.01	21.01	10	82.4

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB3A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-18 Date(s) Analyzed: 11/21/02 11/26/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(a)anthracene	1	16.19	15.62	16.62	20	
	2	16.43	16.00	17.00	29	36.7
Benzo(a)pyrene	1	20.70	20.15	21.15	41	
	2	18.61	18.21	19.21	27	41.2
Indeno(1,2,3-cd)pyrene	1	24.18	23.71	24.71	39	
	2	20.07	19.69	20.69	48	20.7
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB3B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-19 Date(s) Analyzed: 11/21/02 11/26/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.32	8.99	9.99	12	
	2	10.96	10.83	11.83	17	34.5
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB3C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-20 Date(s) Analyzed: 11/21/02 11/26/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.61	13.16	14.16	11	
	2	15.07	14.72	15.72	14	24.0
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

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PESTICIDE IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB4B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-15 Date(s) Analyzed: 11/21/02 11/26/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Fluoranthene	1	12.90	12.37	13.37	7.1	
	2	14.73	14.20	15.20	21	98.9
Benzo(b)fluoranthene	1	18.56	18.16	19.16	2.7	
	2	18.05	17.55	18.55	8.4	102.7
Dibenzo(a,h)anthracene	1	21.84	21.56	22.56	5.7	
	2	18.90	18.80	19.80	16	94.9
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB4C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-16 Date(s) Analyzed: 11/21/02 11/26/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.41	8.99	9.99	10	
	2	11.02	10.83	11.83	15	40.0
Pyrene	1	13.56	13.16	14.16	14	
	2	15.59	14.72	15.72	9.6	37.3
Benzo(b)fluoranthene	1	18.57	18.16	19.16	2.8	
	2	17.77	17.55	18.55	13	129.1
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB6A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-11 Date(s) Analyzed: 11/22/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.49	6.56	7.56	27	
	2	10.20	9.83	10.83	33	20.0
Acenaphthene	1	9.48	8.99	9.99	21	
	2	10.92	10.83	11.83	18	15.4
Pyrene	1	13.62	13.16	14.16	17	
	2	15.34	14.72	15.72	7.7	75.3
Fluoranthene	1	12.96	12.37	13.37	11	
	2	14.77	14.20	15.20	26	81.1
Chrysene	1	17.36	16.32	17.32	5.2	
	2	16.61	16.00	17.00	4.6	12.2
Benzo(b)fluoranthene	1	18.98	18.16	19.16	5.4	
	2	18.04	17.55	18.55	3.6	40.0
Benzo(k)fluoranthene	1	20.03	19.22	20.22	3.9	
	2	18.18	17.68	18.68	10	87.8
Indeno(1,2,3-cd)pyrene	1	24.68	23.71	24.71	4.7	
	2	20.32	19.69	20.69	6.9	37.9

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB6C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-13 Date(s) Analyzed: 11/21/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.34	8.99	9.99	18	
	2	10.98	10.83	11.83	55	101.4
Fluoranthene	1	12.83	12.37	13.37	10	
	2	14.77	14.20	15.20	22	75.0
Benzo(k)fluoranthene	1	20.12	19.22	20.22	65	
	2	17.79	17.68	18.68	2.2	186.9
Benzo(a)pyrene	1	20.43	20.15	21.15	16	
	2	18.73	18.21	19.21	3.3	131.6
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-12 Date(s) Analyzed: 11/22/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.85	13.16	14.16	750	
	2	15.24	14.72	15.72	440	52.1
Phenanthrene	1	11.06	10.38	11.38	500	
	2	13.35	12.82	13.82	500	0.0
Fluoranthene	1	13.05	12.37	13.37	600	
	2	14.72	14.20	15.20	770	24.8
Chrysene	1	16.81	16.32	17.32	2500	
	2	16.47	16.00	17.00	180	173.1
Benzo(b)fluoranthene	1	18.91	18.16	19.16	150	
	2	17.97	17.55	18.55	170	12.5
Benzo(k)fluoranthene	1	19.99	19.22	20.22	90	
	2	18.12	17.68	18.68	200	75.9
Benzo(g,h,i)perylene	1	23.65	22.69	23.69	92	
	2	20.59	20.01	21.01	51	57.3
Benzo(a)anthracene	1	16.32	15.62	16.62	230	
	2	16.47	16.00	17.00	180	24.4

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PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB6F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-12 Date(s) Analyzed: 11/22/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(a)pyrene	1	20.93	20.15	21.15	170	
	2	18.61	18.21	19.21	170	0.0
Indeno(1,2,3-cd)pyrene	1	24.81	23.71	24.71	110	
	2	20.06	19.69	20.69	120	8.7
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB7A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-6 Date(s) Analyzed: 11/22/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Fluoranthene	1	13.07	12.37	13.37	7.4	
	2	14.70	14.20	15.20	9.6	25.9
Benzo(b)fluoranthene	1	18.99	18.16	19.16	2.5	
	2	18.04	17.55	18.55	2.5	0.0
Benzo(k)fluoranthene	1	20.05	19.22	20.22	2.0	
	2	18.19	17.68	18.68	4.0	66.7
Benzo(a)anthracene	1	16.43	15.62	16.62	3.1	
	2	16.48	16.00	17.00	3.0	3.3
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB7ARE

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-6 Date(s) Analyzed: 12/09/02 12/10/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	16.02	15.44	16.43	68	
	2	14.13	13.51	14.51	59	14.2
Phenanthrene	1	13.95	13.38	14.38	55	
	2	11.35	10.71	11.71	51	7.5
Fluoranthene	1	15.41	14.85	15.85	130	
	2	13.34	12.71	13.71	86	40.7
Chrysene	1	17.36	16.77	17.77	27	
	2	17.06	16.69	17.69	210	154.4
Benzo(b)fluoranthene	1	18.95	18.46	19.46	42	
	2	19.03	18.58	19.58	20	71.0
Benzo(k)fluoranthene	1	19.13	18.61	19.61	53	
	2	20.03	19.62	20.62	14	116.4
Dibenzo(a,h)anthracene	1	20.36	19.82	20.82	19	
	2	22.50	21.97	22.97	5.7	107.7
Benzo(g,h,i)perylene	1	21.85	21.26	22.26	51	
	2	23.57	23.29	24.29	12	123.8

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB7ARE

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-6 Date(s) Analyzed: 12/09/02 12/10/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(a)anthracene	1	17.36	16.77	17.77	27	
	2	16.53	15.99	16.99	24	11.8
Benzo(a)pyrene	1	19.71	19.25	20.25	31	
	2	20.96	20.57	21.57	25	21.4
Indeno(1,2,3-cd)pyrene	1	21.50	20.90	21.90	9.2	
	2	24.57	24.31	25.31	14	41.4
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB7B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-8 Date(s) Analyzed: 11/22/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.64	13.16	14.16	90	
	2	15.08	14.24	15.24	9.5	161.8
Chrysene	1	16.79	16.32	17.32	1800	
	2	15.88	15.52	16.52	7.3	198.4
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB7F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-7 Date(s) Analyzed: 11/22/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	6.89	6.56	7.56	5500	
	2	9.70	9.38	10.38	2900	61.9
Acenaphthene	1	9.44	8.99	9.99	3200	
	2	10.53	10.36	11.36	9100	95.9
Pyrene	1	13.77	13.16	14.16	190	
	2	14.81	14.24	15.24	86	75.4
Phenanthrene	1	11.01	10.38	11.38	67	
	2	12.91	12.35	13.35	190	95.7
Fluoranthene	1	12.99	12.37	13.37	160	
	2	14.25	13.73	14.73	310	63.8
Chrysene	1	17.39	16.32	17.32	25	
	2	15.95	15.52	16.52	6.8	114.5
Benzo(b)fluoranthene	1	19.10	18.16	19.16	96	
	2	17.22	17.00	18.00	280	97.9
Benzo(a)anthracene	1	16.46	15.62	16.62	300	
	2	15.95	15.52	16.52	6.8	191.1

10A
PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB8C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-5 Date(s) Analyzed: 11/22/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.42	6.56	7.56	1100	
	2	9.64	9.38	10.38	1300	16.7
Acenaphthene	1	9.45	8.99	9.99	1200	
	2	10.73	10.36	11.36	56	182.2
Fluorene	1	9.99	9.40	10.40	160	
	2	12.08	11.51	12.51	75	72.3
Pyrene	1	13.81	13.16	14.16	1100	
	2	14.75	14.24	15.24	650	51.4
Phenanthrene	1	11.00	10.38	11.38	1100	
	2	12.89	12.35	13.35	1000	9.5
Anthracene	1	11.88	11.42	12.42	130	
	2	13.26	12.72	13.72	54	82.6
Fluoranthene	1	13.00	12.37	13.37	1600	
	2	14.24	13.73	14.73	3200	66.7
Chrysene	1	17.09	16.32	17.32	640	
	2	16.00	15.52	16.52	340	61.2

FORM X PEST-1

10A
PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.
40SB8C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-5 Date(s) Analyzed: 11/22/02 11/24/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(b)fluoranthene	1	18.97	18.16	19.16	460	
	2	17.51	17.00	18.00	430	6.7
Benzo(k)fluoranthene	1	20.05	19.22	20.22	270	
	2	17.64	17.12	18.12	570	71.4
Dibenzo(a,h)anthracene	1	22.54	21.56	22.56	160	
	2	18.69	18.22	19.22	64	85.7
Benzo(g,h,i)perylene	1	23.61	22.69	23.69	250	
	2	19.90	19.37	20.37	140	56.4
Benzo(a)anthracene	1	16.36	15.62	16.62	540	
	2	16.00	15.52	16.52	340	45.4
Benzo(a)pyrene	1	20.98	20.15	21.15	380	
	2	18.15	17.64	18.64	310	20.3
Indeno(1,2,3-cd)pyrene	1	24.73	23.71	24.71	290	
	2	19.31	19.09	20.09	3600	170.2
Acenaphthylene	1	8.34	7.60	8.60	210	
	2	12.08	11.51	12.51	75	94.7

10A

EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

D-2

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-10 Date(s) Analyzed: 11/22/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.51	6.56	7.56	690	
	2	10.32	9.83	10.83	100	149.4
Pyrene	1	13.63	13.16	14.16	260	
	2	15.24	14.72	15.72	310	17.5
Chrysene	1	16.82	16.32	17.32	2400	
	2	16.52	16.00	17.00	12	198.0
Benzo(b)fluoranthene	1	18.70	18.16	19.16	86	
	2	18.10	17.55	18.55	60	35.6
Benzo(a)anthracene	1	16.50	15.62	16.62	140	
	2	16.52	16.00	17.00	12	168.4
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

D-3

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-14 Date(s) Analyzed: 11/22/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.43	8.99	9.99	1900	
	2	11.44	10.83	11.83	80	183.8
Pyrene	1	13.82	13.16	14.16	770	
	2	15.30	14.72	15.72	810	5.1
Phenanthrene	1	10.98	10.38	11.38	740	
	2	13.38	12.82	13.82	780	5.3
Fluoranthene	1	13.00	12.37	13.37	1100	
	2	14.74	14.20	15.20	2400	74.3
Chrysene	1	17.08	16.32	17.32	470	
	2	16.55	16.00	17.00	370	23.8
Benzo(b)fluoranthene	1	18.93	18.16	19.16	270	
	2	18.07	17.55	18.55	850	103.6
Benzo(k)fluoranthene	1	19.98	19.22	20.22	160	
	2	18.21	17.68	18.68	1000	144.8
Benzo(a)anthracene	1	16.49	15.62	16.62	3800	
	2	16.55	16.00	17.00	370	164.5

FORM X PEST-1

10A
PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

D-3

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-14 Date(s) Analyzed: 11/22/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(a)pyrene	1	20.88	20.15	21.15	220	
	2	18.72	18.21	19.21	900	121.4
Indeno(1,2,3-cd)pyrene	1	24.56	23.71	24.71	150	
	2	20.16	19.69	20.69	650	125.0
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

D-4

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: S2788-17 Date(s) Analyzed: 11/21/02 11/26/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.42	8.99	9.99	740	
	2	10.86	10.83	11.83	17	191.0
Pyrene	1	13.60	13.16	14.16	11	
	2	15.54	14.72	15.72	28	87.2
Benzo(b)fluoranthene	1	18.57	18.16	19.16	2.8	
	2	17.74	17.55	18.55	24	158.2
Benzo(a)pyrene	1	20.41	20.15	21.15	2.4	
	2	18.82	18.21	19.21	2.9	18.9
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

PBLKVJ

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2788

Lab Sample ID: WG21446-1 Date(s) Analyzed: 11/21/02 11/25/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.75	13.16	14.16	12	
	2	15.51	14.72	15.72	5.7	71.2
Benzo(b)fluoranthene	1	18.64	18.16	19.16	2.3	
	2	17.73	17.55	18.55	43	179.7
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

DATA VALIDATION WORKSHEET

Explosives

Reviewer: AJ
Date: 01/28/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: 52788
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?		X	
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	X		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes:

COC 1014 samples received too cold (1.1°C) see letter from lab.
No action taken.

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: Cooler temps: 2.0°C, 1.1°C, 2.0°C, 2.5°C
↑ below QC criteria of 2.0°C No action taken

sampled 11/13/02, 11/14/02
extracted 11/19/02
analysis 11/21/02, 11/22/02, 11/23/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".	X		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			X

Notes: PBLKVA - Hmx 0.38 - No action taken since all results ND.
No equipment/field blanks in this batch

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		X	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.			

Notes: CCV060NFULL4SZ: 2,4,6 TNT %D - 19.32 % (UJ, C ND's) 4-NT %D: 18.71 % - no action. ND's.
CCV072NFULL4TA: 4-NT %D: 20.32% - no action all ND's. →

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? 50-150 %	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	X		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MSD %R 1,3,5TNB = 48%. ~~No action taken since~~ all results were ND UJ in 405B8B

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: D-2 / 405B7F } All results ND. So nothing
D-3 / 405B4F } to address here.
D-4 / 405B4C }

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: Ø			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100 %			
	% Completeness = 100 %			

Notes:

COC # 1014

CompuChem
a division of Liberty Analytical Corporation

QUALITY ASSURANCE NOTICE

Client Dames & Moore / URS / CLC
Case # _____
Type of Analysis Semivolatile Organic Compounds, Polyaromatic Hydrocarbons TCL Pest, TCL Polychlorinated Biphenyl Explosives, Metals
Receipt Date 11-14-02

For some organic and/or inorganic determinations temperature preservation at 4 degrees Celsius is required for environmental samples during shipment to the laboratory and prior to analysis. A temperature tolerance range is generally allowed. Temperature of a representative sample from the shipping container is taken and recorded by the receiving clerk at the time of sample receipt. This temperature is representative of all samples contained in the cooler. The EPA CLP program requires the laboratory make notification when the temperature exceeds 10 degrees Celsius. The State of North Carolina allows a range of 2-4.4° Celsius. Notification to other clients is either client or project dependent.

Samples that are hand delivered to the laboratory immediately after collection may not meet this criteria. In these cases, the samples shall be considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The temperature of this sample at the time of receipt was determined to be 1.1 °C.

A CompuChem customer service representative contacted the client. The client instructed the Receiving department to:

Hand Delivery/Received on ice ✓
Analyze - qualify with notice ✓
Dispose - client will resample _____

Supervisor Signature/ID _____ Date 11/14/02

QAN-R-3
020205

qanr3 – 2/5/02:dce

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1013

Project Number	Project Name
09604.258	RFAAP

Project Contact (Name and Phone Number): Darren Rowe

Samplers: Fisler / Spangler

LAB: G

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405B10A	11/13/02 800	5		X	9	E		4		X	X	X	X	X		X							GEB 11-14-02
405B10F	810	5		X	9	E		3		X	X		X	X		X							Only received 3 8oz jars
405B10B	820	5		X	9	E		3		X	X		X	X		X							and received 1 8oz
405B10C	830	5		X	9	E		3		X	X		X	X		X							without any ID mark
405B9A	845	5		X	9	E		4		X	X	X	X	X		X							time. (Blank) CS 11/14/02
405B9F	855	5		X	9	E		3		X	X		X	X		X							
405B9C	930	5		X	9	E		3		X	X		X	X		X							
405B9CMS	950	5		X	9	E		3		X	X		X	X		X							
405B9CMSD	930	5		X	9	E		3		X	X		X	X		X							

Box #1 1. Surface Water; 2. Ground Water; 3. Leachate; 4. Rinsate; 5. Soil Sediment/Sludge; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other ____

Box #2 A. HCl + Ice; B. HNO3 + Ice; C. NaOH + Ice; D. H2SO4 + Ice; E. Unpreserved; F. Ice Only; G. Other ____; H. NaHSO4 + Ice; I. ZnAc + NaOH + Ice

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard 28 Day; T. Timely 14 Day; O. Other ____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	11/12/02 1600				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 11-14-02 9:00 am	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1014

Project Number	Project Name
07604-258	RFAAP

Project Contact (Name and Phone Number): Darren Rennel

Samplers: Fisher / Spangler

LAB: 60

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405B8A	11/13/02 1000	5		X	9	E		4		X	X	X	X	X		X							
405B8F	1015			X				3		X	X		X	X		X							
405B8C	1030			X				3		X	X		X	X		X							
405B7A	1100			X				4		X	X	X	X	X		X							
405B7F	1120			X				3		X	X		X	X		X							
[redacted]D-2				X				3		X	X		X	X		X							
405B7B	1145			X				3		X	X		X	X		X							
405B7C	1200	↓		X	↓	↓		3		X	X		X	X		X							
405B[redacted]A	1400			X				4		X	X	X	X	X		X							
405B6F	1415			X				3		X	X	[redacted]	[redacted]	X		X							PCB for 405B6F
405B6C	1430	↓		X				3		X	X	[redacted]	X	X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	11/13/02 1800				
Relinquished by: [signature]	Date/time 11/13/02	Received by: (for lab) [signature]	Date/Time 11-14-02 9:00	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp = 0°C (1.1°C) CAB 11-14-02

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1100

Project Number	Project Name
07(C7-25	RFAAP

Project Contact (Name and Phone Number): Darren Ranua

Samplers: Fisher Spangler

LAB: 278

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405BSA	11/14/02 845	S		X	9	E		4		X	X	X	X	X		X							
405BSF	11/14/02 900	S		X	9	E		3		X	X	[redacted]	X	X		X							
405BSC	11/14/02 920	S		X	9	E		3		X	X		X	X		X							Light on soil, fell apart
405B4A	11/14/02 945	S		X	9	E		4		X	X	X	X	X		X							
405B4F	11/14/02 1000	S		X	9	E		3		X	X		X	X		X							
D-3	11/14/02	S		X	9	E		3		X	X		X	X		X							
405B4B	11/14/02 1045	S		X	9	E		3		X	X		X	X		X							
405B4C	11/14/02 1315	S		X	9	E		3		X	X		X	X		X							
D-4	11/14/02	S		X	9	E		3		X	X		X	X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brad Fowler 11/14/02	1800				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	
11/14/02	18	Maxine J. Bailey	11-15-02 9:00		

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1101

Project Number	Project Name
89604258	RFAAP

Project Contact (Name and Phone Number): Darren Rennie

Samplers: Fisher / Spangler

LAB: 279

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405B3A	11/14/02 1445	S		X	9	E		4		X	X	X	X	X		X							
405B3B	11/14/02 1500	S		X	9	E	4	3		X	X	X	X	X		X							
405B3B MS	11/14/02 1500	S		X	9	E	4	3		X	X	X	X	X		X							
405B3B MSD	11/14/02 1500	S		X	9	E	4	3		X	X	X	X	X		X							
405B5C	11/14/02 1530	S		X	9	E		3		X	X		X	X		X							

Box #1 (Matrix Type)
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2 (Preservative)
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3 (Filtered or Unfiltered)
F. Filtered
U. Unfiltered

Box #4 (Turnaround Time)
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	11/14/02 1800				
[signature]	11/14/02 [illegible]	Received by: (for lab) [signature]	Date/Time 11-15-02 9:00		

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

Temp: 2.5°C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKVA

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21436-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/19/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	0.38	J
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN74 Calibration Date: 11/21/02 Time: 1439

Lab File ID: 060NFULL4SZ Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1248.2240	1248.2240	0.01	-5.41	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	3736.8000	3736.8000	0.01	2.39	15.00	AVRG	
RDX	32.595987	31.250000	1662.8480	0.01	-4.31		LINR	
1,3-Dinitrobenzene	4880.9730	5129.6320	5129.6320	0.01	-5.09	15.00	AVRG	
2,4,6-Trinitrotoluene	2567.0750	2071.2000	2071.2000	0.01	-19.32	15.00	AVRG	<- UJ, <
Tetryl	3844.6050	3616.8480	3616.8480	0.01	-5.92	15.00	AVRG	
Nitrobenzene	7689.2100	7233.6960	7233.6960	0.01	-5.92	15.00	AVRG	
2,4-Dinitrotoluene	3994.7010	4282.9120	4282.9120	0.01	7.21	15.00	AVRG	
2,6-Dinitrotoluene	2601.4990	2475.5040	2475.5040	0.01	-4.84	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3407.9520	3407.9520	0.01	4.34	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	50.021647	62.500000	2405.3760	0.01	19.96		LINR	ND, no
2-Nitrotoluene	1987.5310	2060.8000	2060.8000	0.01	3.69	15.00	AVRG	
4-Nitrotoluene	1448.9760	1720.1120	1720.1120	0.01	18.71	15.00	AVRG	<- flag
3-Nitrotoluene	1945.6140	2191.1200	2191.1200	0.01	12.62	15.00	AVRG	
1,4-Dinitrobenzene	3915.6410	4122.1920	4122.1920	0.01	5.28	15.00	AVRG	

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN74 Calibration Date: 11/22/02 Time: 0100

Lab File ID: 072NFULL4TA Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1287.0400	1287.0400	0.01	-2.47	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	3992.3520	3992.3520	0.01	9.39	15.00	AVRG	
RDX	32.527679	31.250000	1659.6160	0.01	-4.09		LINR	
1,3-Dinitrobenzene	4880.9730	5221.2800	5221.2800	0.01	6.97	15.00	AVRG	
2,4,6-Trinitrotoluene	2567.0750	2280.7680	2280.7680	0.01	-11.15	15.00	AVRG	
Tetryl	3844.6050	3502.9600	3502.9600	0.01	-8.89	15.00	AVRG	
Nitrobenzene	7689.2100	7005.9200	7005.9200	0.01	-8.89	15.00	AVRG	
2,4-Dinitrotoluene	3994.7010	4051.4240	4051.4240	0.01	1.42	15.00	AVRG	
2,6-Dinitrotoluene	2601.4990	2599.4560	2599.4560	0.01	-0.08	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3431.0080	3431.0080	0.01	5.04	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	60.583114	62.500000	2985.2640	0.01	3.07		LINR	
2-Nitrotoluene	1987.5310	2108.1440	2108.1440	0.01	6.07	15.00	AVRG	
4-Nitrotoluene	1448.9760	1743.3600	1743.3600	0.01	20.32	15.00	AVRG	<-
3-Nitrotoluene	1945.6140	2177.6320	2177.6320	0.01	11.92	15.00	AVRG	
1,4-Dinitrobenzene	3915.6410	4122.1440	4122.1440	0.01	5.27	15.00	AVRG	

ND no flag

FORM VII 8330

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN74 Calibration Date: 11/22/02 Time: 2331

Lab File ID: 098NFULL4TC Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1398.4640	1398.4640	0.01	5.97	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	3675.6800	3675.6800	0.01	0.72	15.00	AVRG	
RDX	32.784004	31.250000	1671.7440	0.01	-4.91		LINR	
1,3-Dinitrobenzene	4880.9730	5430.2080	5430.2080	0.01	11.25	15.00	AVRG	
2,4,6-Trinitrotoluene	2567.0750	1643.2960	1643.2960	0.01	-35.98	15.00	AVRG	<-
Tetryl	3844.6050	3518.4320	3518.4320	0.01	-8.48	15.00	AVRG	
Nitrobenzene	7689.2100	7036.8640	7036.8640	0.01	-8.48	15.00	AVRG	
2,4-Dinitrotoluene	3994.7010	4933.0560	4933.0560	0.01	23.49	15.00	AVRG	<-
2,6-Dinitrotoluene	2601.4990	2557.1520	2557.1520	0.01	-1.70	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3316.8000	3316.8000	0.01	1.54	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	54.009553	62.500000	2624.3360	0.01	13.58		LINR	
2-Nitrotoluene	1987.5310	2069.6960	2069.6960	0.01	4.13	15.00	AVRG	
4-Nitrotoluene	1448.9760	1767.1840	1767.1840	0.01	21.96	15.00	AVRG	<-
3-Nitrotoluene	1945.6140	2287.7440	2287.7440	0.01	17.58	15.00	AVRG	<-
1,4-Dinitrobenzene	3915.6410	4034.9840	4034.9840	0.01	3.05	15.00	AVRG	

FORM VII 8330

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Instrument ID: VARIAN74 Calibration Date: 11/23/02 Time: 0909

Lab File ID: 110NFULL4TD Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1317.1520	1317.1520	0.01	-0.19	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	4283.8080	4283.8080	0.01	17.38	15.00	AVRG	<-
RDX	35.667151	31.250000	1808.1600	0.01	-14.13		LINR	
1,3-Dinitrobenzene	4880.9730	6019.2000	6019.2000	0.01	23.32	15.00	AVRG	<-
2,4,6-Trinitrotoluene	2567.0750	2080.6080	2080.6080	0.01	-18.95	15.00	AVRG	<-
Tetryl	3844.6050	3775.4880	3775.4880	0.01	-1.80	15.00	AVRG	
Nitrobenzene	7689.2100	7550.9760	7550.9760	0.01	-1.80	15.00	AVRG	
2,4-Dinitrotoluene	3994.7010	5273.2800	5273.2800	0.01	32.01	15.00	AVRG	<-
2,6-Dinitrotoluene	2601.4990	2685.1680	2685.1680	0.01	3.22	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3507.0400	3507.0400	0.01	7.37	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	49.989592	62.500000	2403.6160	0.01	20.02		LINR	
2-Nitrotoluene	1987.5310	2211.6160	2211.6160	0.01	11.27	15.00	AVRG	
4-Nitrotoluene	1448.9760	1873.4880	1873.4880	0.01	29.30	15.00	AVRG	<-
3-Nitrotoluene	1945.6140	2441.6160	2441.6160	0.01	25.49	15.00	AVRG	<-
1,4-Dinitrobenzene	3915.6410	4309.7840	4309.7840	0.01	10.06	15.00	AVRG	

8D
PESTICIDE ANALYTICAL SEQUENCE

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

GC Column: C18 ID: 3.90 (mm) Init. Calib. Date(s): 11/19/02 11/19/02

Instrument ID: VARIAN74

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 12.64

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #	RT #
01	FULL5ST	FULL5ST	11/19/02	1547	12.62	
02	FULL4ST	FULL4ST	11/19/02	1634	12.66	
03	FULL3ST	FULL3ST	11/19/02	1720	12.62	
04	FULL2ST	FULL2ST	11/19/02	1807	12.67	
05	FULL1ST	FULL1ST	11/19/02	1853	12.62	
06	FULL4SZ	FULL4SZ	11/21/02	1439	12.64	
07	LIBLKSZ	LIBLKSZ	11/21/02	1628	12.65	
08	PBLKVA	WG21436-1	11/21/02	1715	12.65	
09	PLCSVA	WG21436-2	11/21/02	1802	12.64	
10	40SB3BMS	WG21436-4	11/21/02	1848	12.69	
11	40SB3BMSD	WG21436-5	11/21/02	1935	12.71	
12	40SB10A	S2788-1	11/21/02	2021	12.72	
13	40SB10F	S2788-2	11/21/02	2108	12.67	
14	40SB10B	S2788-3	11/21/02	2154	12.70	
15	40SB10C	S2788-4	11/21/02	2240	12.65	
16	40SB8C	S2788-5	11/21/02	2327	12.65	
17	FULL4TA	FULL4TA	11/22/02	0100	12.68	
18	LIBLKTA	LIBLKTA	11/22/02	0146	12.68	
19	40SB7A	S2788-6	11/22/02	0233	12.64	
20	40SB7F	S2788-7	11/22/02	0319	12.65	
21	40SB7B	S2788-8	11/22/02	0406	12.68	
22	40SB7C	S2788-9	11/22/02	0452	12.68	
23	D-2	S2788-10	11/22/02	0539	12.61	
24	40SB6A	S2788-11	11/22/02	0625	12.66	
25	40SB6F	S2788-12	11/22/02	0712	12.63	
26	40SB6C	S2788-13	11/22/02	0758	12.63	
27	D-3	S2788-14	11/22/02	0844	12.63	
28	FULL4TB	FULL4TB	11/22/02	1035	12.64	
29	LIBLKTB	LIBLKTB	11/22/02	1125	12.71	
30	FULL4TC	FULL4TC	11/22/02	2331	12.38	
31	LIBLKTC	LIBLKTC	11/23/02	0036	12.42	
32	40SB3C	S2788-20	11/23/02	0122	12.47	

QC LIMITS
S1 = 1,4-Dinitrobenzene (+/- 0.50 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

8D
PESTICIDE ANALYTICAL SEQUENCE

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

GC Column: C18 ID: 3.90 (mm) Init. Calib. Date(s): 11/19/02 11/19/02

Instrument ID: VARIAN74

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 12.64

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #	RT #
01	40SB3B	S2788-19	11/23/02	0211	12.40	
02	40SB3A	S2788-18	11/23/02	0257	12.38	
03	D-4	S2788-17	11/23/02	0344	12.39	
04	40SB4C	S2788-16	11/23/02	0430	12.38	
05	40SB4B	S2788-15	11/23/02	0517	12.40	
06	ZZZZZ	ZZZZZ	11/23/02	0736	12.41	
07	ZZZZZ	ZZZZZ	11/23/02	0823	12.41	
08	FULL4TD	FULL4TD	11/23/02	0909	12.41	
09	LIBLKTD	LIBLKTD	11/23/02	0956	12.42	
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

QC LIMITS
S1 = 1,4-Dinitrobenzene (+/- 0.50 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix Spike - EPA Sample No.: 40SB3B

COMPOUND	SPIKE ADDED (mg/Kg	MSD CONCENTRATION (mg/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	3.0	3.0	100	7	30	50-150
1,3,5-Trinitrobenzene	2.0	0.97	48*	21	30	50-150
RDX	2.0	2.5	125	15	30	50-150
1,3-Dinitrobenzene	2.0	2.2	110	4	30	50-150
2,4,6-Trinitrotoluene	2.0	2.4	120	8	30	50-150
Tetryl	3.0	2.8	93	7	30	50-150
Nitrobenzene	2.0	1.4	70	7	30	50-150
2,4-Dinitrotoluene	2.0	2.1	105	0	30	50-150
2,6-Dinitrotoluene	3.0	2.7	90	0	30	50-150
2-Amino-4,6-dinitrotolu	3.0	2.7	90	0	30	50-150
4-Amino-2,6-dinitrotolu	3.0	4.2	140	0	30	50-150
2-Nitrotoluene	3.0	3.0	100	3	30	50-150
4-Nitrotoluene	3.0	3.3	110	0	30	50-150
3-Nitrotoluene	3.0	3.1	103	3	30	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 14 outside limits
Spike Recovery: 1 out of 28 outside limits

COMMENTS: _____

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1013

Project Number	Project Name
09604-258	RFAAP

Project Contact (Name and Phone Number): Darren Rowe

Samplers: Fisher / Spangler

LAB: G

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405B10A	11/13/02 800	5		X	9	E		4		X	X	X	X	X		X							GEB 11-14-02
405B10E	810	5		X	9	E		3		X	X		X	X		X							Only received 3 - 8oz jars
405B10B	820	5		X	9	E		3		X	X		X	X		X							and received 1 - 8oz
405B10C	830	5		X	9	E		3		X	X		X	X		X							without any ID on
*405B9A	845	5		X	9	E		4		X	X	X	X	X		X							time. (Blank) GS 11/14/02
405B9E	855	5		X	9	E		3		X	X		X	X		X							
405B9C	930	5		X	9	E		3		X	X		X	X		X							
405B9CMS	950	5		X	9	E		3		X	X		X	X		X							
405B9CMSD	930	5		X	9	E		3		X	X		X	X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Other

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Lee	11/13/02 1800				
Relinquished by:	Date/time	Received by: (for lab) Marcus Baldy	Date/Time 11-14-02 9:00 am	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1014

Project Number	Project Name
0960-258	RFAAP

Project Contact (Name and Phone Number): Darren Rennel

Samplers: Fisher / Spangler

LAB: 60

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
405B8A	11/13/02 1000	5		X	9	E		4		X	X	X	X	X		X							
405B8F	1015			X				3		X	X		X	X		X							
405B8C	1030			X				3		X	X		X	X		X							
405B7A	1100			X				4		X	X	X	X	X		X							
405B7F	1120			X				3		X	X		X	X		X							
[redacted]D-2				X				3		X	X		X	X		X							
405B7B	1145			X				3		X	X		X	X		X							
405B7C	1200			X				3		X	X		X	X		X							
405B[redacted]A	1400			X				4		X	X	X	X	X		X							
405B6F	1415			X				3		X	X	[redacted]	[redacted]	X		X							PCB for 405B6F
405B6C	1430			X				3		X	X	[redacted]	X	X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	11/13/02 1800				
Relinquished by: [signature]	Date/time 11/14/02	Received by: (for lab) Vincent J. Baldy	Date/Time 11-14-02 9:00	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp = 0°C CAB 11-14-02 (1.10C)

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1104

Project Number	Project Name
09604-258	RFAAP

Project Contact (Name and Phone Number): Darren Reese

Samplers: Fisher / Spangler

LAB: CC

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
EQB-3	11/13/02 1615	5		X	4	E		7		X	X	X	X	X		X							Received 1-AL with EQB-1. Not on C-O-C Per client, put on hold. CC 11/14/02

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	11/13/02 1800				
[signature]	11/13/02	Received by: (for lab) [signature]	Date/Time 11/14/02 9:00		

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

Temp 2.3°C

COC # 1014

CompuChem
a division of Liberty Analytical Corporation

QUALITY ASSURANCE NOTICE

Client Dames & Moore / URS / CLC
Case # _____
Type of Analysis Semivolatile Organic Compounds, Polyaromatic Hydrocarbons TCL Pest, TCL Polychlorinated Biphenyl Explosives, Metals
Receipt Date 11-14-02

For some organic and/or inorganic determinations temperature preservation at 4 degrees Celsius is required for environmental samples during shipment to the laboratory and prior to analysis. A temperature tolerance range is generally allowed. Temperature of a representative sample from the shipping container is taken and recorded by the receiving clerk at the time of sample receipt. This temperature is representative of all samples contained in the cooler. The EPA CLP program requires the laboratory make notification when the temperature exceeds 10 degrees Celsius. The State of North Carolina allows a range of 2-4.4° Celsius. Notification to other clients is either client or project dependent.

Samples that are hand delivered to the laboratory immediately after collection may not meet this criteria. In these cases, the samples shall be considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The temperature of this sample at the time of receipt was determined to be 1.1 °C.

A CompuChem customer service representative contacted the client. The client instructed the Receiving department to:

Hand Delivery/Received on ice ✓
Analyze - qualify with notice ✓
Dispose - client will resample _____

Supervisor Signature/ID _____ Date 11/14/02

QAN-R-3
020205

qanr3 – 2/5/02:dcc

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: AJ
Date: 01/30/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54 46/71
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: S2788
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?		X	
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	X		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids			
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?			

Notes: missing COC's for samples 40SB3A, 40SB3B, 40SB3C, 40SB4B, 40SB4C, D-3, D-4
COC 1014 samples: 40SB16A, 40SB16C, 40SB16F, 40SB17A, 40SB17B, 40SB17C, 40SB17F, D-2, received by lab at 1.1°C. No action taken.

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.			

Notes: samples from COC 1014 preserved too cold. No action taken.

sampled - 11/13/02, 11/14/02
received - 11/19/02
analysis - 11/24/02, 11/25/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	~~X~~
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		~~X~~

Notes: ~~No field equipment blanks in this batch~~
all ND in R27885
RA

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).	X		
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? 50-150%	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS/MSD done on sample 405B3B

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: NO LCSD performed

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report. All results N.D.	X		

Notes:

D-2 405B7F
D-3 405B4F
D-4 405B4C

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: Ø			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100 %			
	% Completeness = 100 %			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: S2788
Project No.: 15295137.10000

Project Name: Radford SWMU 40/71
Reviewer: RA
Date: 2/12/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note:

collected	analyzed	
11/13/02	11/19/02 Hg	11/19, 20, 21/02 ICP
11/14/02	" " Hg	" "

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%?		✓				
	<50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						

Note: See attached

Dos ≤2xCRDL → KIW unless prev. flagged

Ba .22
Ca - 7.88
mg 33.16
zn .785

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L						✓
4.5	Are there reported field blankor trip blank values > ± MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						

Note: MB → ba .044, ca - 1.576, mg 6.632, zinc .157 mg/kg all pos and 75x, no flags
ICB, CCB also low levels ca, al, ba, be, Fe, Mg, all 75x, no flags
in R2708 { EQB-3, ba .39, Fe 12.6 Na 758 11/14/02 Pos Na <5x → B, x
EQB-4 ba .36 Na 529 11/15/02 all others 75x, no flag

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓		✓			
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓		✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note: _____

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note: _____

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.		✓		✓	✓	

Note: Mg 55.4
Potassium 38.1 Pos J1K

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓		
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L						
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	✓					✓

Note: See attached
L, UL, M unless prev. flagged-

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note: See attached
Pos J, S unless prev flagged

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		✓			✓	

Note: See attached 405B7F/D-2
aluminum, arsenic, barium, cadmium, calcium, copper, iron magnesium, manganese, potassium, silver, sodium, vanadium and-

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓		
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note: _____

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples: _____						
13.1.2	Number of target compounds in each analysis: _____						
13.1.3	Number of results rejected and not reported: _____						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = _____						

Note: _____

	405B7F	D-2	% RPD
Al	5720	17700	100%
Sb	.56	.490 OK	
As	.98	3.3	105%
Ba	35.5	65.3	59%
Be	.29	.880K	
Cd	.30	1.7	140%
Ca	6250	41900	148%
Cr	24.8	32	25% OK
Co	5.1	4.3	OK
Cu	9.9	23.2	80%
Fe	10900	18800	53%
Pb	15	11.8	OK
Mg	2200	29100	171%
Mn	135	194	36%
Hg	1.8	.68 OK	
Ni	15	18.9	23% OK
K	482	4280	159%
Se	.61	.560K	
Ag	.82	4.6	139%
Na	598	1540	88%
V	15.4	38	84%
Zn	31.2	42.6	30% OK✓

SW846 METALS

3

BLANKS

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	21.8	U	26.8	B	21.8	U	21.8	U	2.180	U	P
Antimony	3.7	U	3.7	U	3.7	U	3.7	U	0.370	U	P
Arsenic	2.5	U	3.5	B	3.1	B	2.5	U	0.250	U	P
Barium	0.4	B	0.7	B	0.6	B	0.5	B	0.044	B	P
Beryllium	0.1	U	0.3	B	0.2	B	0.1	B	0.010	U	P
Cadmium	0.4	U	0.4	U	0.4	U	0.4	U	0.040	U	P
Calcium	24.8	B	57.3	B	20.8	B	18.4	B	-1.576	B	P
Chromium	0.6	U	0.6	U	0.6	U	0.6	U	0.060	U	P
Cobalt	0.6	U	0.6	U	0.6	U	0.6	U	0.060	U	P
Copper	1.4	U	1.4	U	1.4	U	1.4	U	0.140	U	P
Iron	13.7	U	18.1	B	13.7	U	13.7	U	1.370	U	P
Lead	2.3	U	2.3	U	2.3	U	2.3	U	0.230	U	P
Magnesium	64.1	B	107.3	B	73.1	B	73.1	B	6.632	B	P
Manganese	0.2	U	0.3	B	0.2	U	0.2	U	0.020	U	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.017	U	CV
Nickel	1.0	U	1.0	U	1.0	U	1.0	U	0.100	U	P
Potassium	118.5	U	118.5	U	118.5	U	118.5	U	11.850	U	P
Selenium	3.3	U	3.3	U	3.3	U	3.3	U	0.330	U	P
Silver	0.7	U	0.7	U	0.7	U	0.7	U	0.070	U	P
Sodium	248.7	U	248.7	U	248.7	U	248.7	U	24.870	U	P
Thallium	5.1	U	5.1	U	5.1	U	5.1	U	0.510	U	P
Vanadium	0.7	U	0.7	U	0.7	U	0.7	U	0.070	U	P
Zinc	1.1	B	1.0	U	1.0	U	1.0	U	0.157	B	P

SW846 METALS

3

BLANKS

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum			21.8	U	21.8	U	21.8	U			P
Antimony			3.7	U	3.7	U	3.7	U			P
Arsenic			2.5	U	2.5	U	2.5	U			P
Barium			0.5	B	0.5	B	0.6	B			P
Beryllium			0.2	B	0.2	B	0.2	B			P
Cadmium			0.4	U	0.4	U	0.4	U			P
Calcium			19.7	B	9.6	U	9.6	U			P
Chromium			0.6	U	0.6	U	0.6	U			P
Cobalt			0.6	U	0.6	U	0.6	U			P
Copper			1.4	U	1.4	U	1.4	U			P
Iron			13.7	U	13.7	U	13.7	U			P
Lead			2.3	U	2.3	U	2.3	U			P
Magnesium			70.7	B	66.2	B	73.0	B			P
Manganese			0.2	U	0.2	U	0.2	U			P
Mercury			0.1	U	0.1	U	0.1	U			CV
Nickel			1.0	U	1.0	U	1.0	U			P
Potassium			118.5	U	118.5	U	118.5	U			P
Selenium			3.3	U	3.3	U	3.3	U			P
Silver			0.7	U	0.7	U	0.7	U			P
Sodium			248.7	U	248.7	U	248.7	U			P
Thallium			5.1	U	5.1	U	5.1	U			P
Vanadium			0.7	U	0.7	U	0.7	U			P
Zinc			1.0	U	1.0	U	1.0	U			P

2B-IN
CRDL STANDARD FOR AA AND ICP

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

AA CRDL Standard Source: HIPUR

ICP CRDL Standard Source: HIPUR

Concentration Units: ug/L

Analyte	True	Found	%R	CRDL Standard for ICP Initial True	Initial Found	Initial %R	Final Found	Final %R
Aluminum				100.0	136.64	136.6		
Antimony				10.0	12.43	124.3		
Arsenic				10.0	13.10	131.0		
Barium				10.0	11.22	112.2		
Beryllium				5.0	5.79	115.8		
Cadmium				5.0	5.75	115.0		
Calcium				1000.0	1042.40	104.2		
Chromium				5.0	5.40	108.0		
Cobalt				5.0	5.62	112.4		
Copper				5.0	4.62	92.4		
Iron				100.0	98.08	98.1		
Lead				3.0	3.77	125.7		
Magnesium				1000.0	1021.07	102.1		
Manganese				10.0	10.87	108.7		
Mercury	0.2	0.21	105.0					
Nickel				5.0	5.27	105.4		
Potassium				1000.0	1222.66	122.3		
Selenium				5.0	6.04	120.8		
Silver				5.0	4.67	93.4		
Sodium				2000.0	1733.38	86.7		
Thallium				10.0	11.80	118.0		
Vanadium				20.0	20.90	104.5		
Zinc				20.0	21.69	108.4		

Control Limits: no limits have been established by EPA at this time

SW846 METALS

6

DUPLICATES

SAMPLE NO.

40SB3BD

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 62.9 % Solids for Duplicate: 62.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		35973.3789		37909.4805		5.2		P
Antimony		0.5882	U	0.5882	U			P
Arsenic	1.6	6.7100		6.8593		2.2		P
Barium		89.3366		91.6733		2.6		P
Beryllium	0.8	1.8526		1.7277		7.0		P
Cadmium		0.2445	B	0.3195	B	26.6		P
Calcium		1590.2910		2026.9640		24.1	*	P
Chromium		45.4632		46.7915		2.9		P
Cobalt		9.9342		13.0525		27.1	*	P
Copper		42.1939		31.4552		29.2	*	P
Iron		42134.1484		39104.7383		7.5		P
Lead		12.9771		14.6457		12.1		P
Magnesium		13518.9297		23876.6191		55.4	*	P
Manganese		515.0889		458.4547		11.6		P
Mercury	0.1	0.0479	B	0.0709		~~38.7~~		CV
Nickel		32.9362		36.7353		10.9		P
Potassium		2574.5681		3785.4309		38.1	*	P
Selenium	0.8	1.6762		1.0674		~~44.4~~		P
Silver		0.1113	U	0.1113	U			P
Sodium		234.1041	B	254.9840	B	8.5		P
Thallium		0.8108	U	0.8108	U			P
Vanadium		73.2280		80.0888		8.9		P
Zinc		47.5196		55.1852		14.9		P

SW846 METALS

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

40SB3BS

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 62.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	26.7979		0.5882	U	79.49	33.7	N	P
Arsenic	75 - 125	11.7773		6.7100		6.36	79.7		P
Barium	75 - 125	310.0068		89.3366		317.96	69.4	N	P
Beryllium	75 - 125	7.7850		1.8526		7.95	74.6	N	P
Cadmium	75 - 125	5.8811		0.2445	B	7.95	70.9	N	P
Chromium	75 - 125	65.4469		45.4632		31.80	62.8	N	P
Cobalt	75 - 125	69.1229		9.9342		79.49	74.5	N	P
Copper	75 - 125	81.3160		42.1939		39.75	98.4		P
Lead		15.6810		12.9771		3.18	85.0		P
Manganese		470.8074		515.0889		79.49	-55.7		P
Mercury	75 - 125	0.3381		0.0479	B	0.26	111.6		CV
Nickel	75 - 125	88.7090		32.9362		79.49	70.2	N	P
Selenium	75 - 125	2.4175		1.6762		1.59	46.6	N	P
Silver	75 - 125	7.1919		0.1113	U	7.95	90.5		P
Thallium	75 - 125	2.4260		0.8108	U	7.95	30.5	N	P
Vanadium	75 - 125	132.5435		73.2280		79.49	74.6	N	P
Zinc	75 - 125	103.7715		47.5196		79.49	70.8	N	P

Comments:

SW846 METALS

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

40SB3BSD

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 62.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	27.3210		0.5882	U	79.49	34.4	N	P
Arsenic	75 - 125	11.4282		6.7100		6.36	74.2	N	P
Barium	75 - 125	326.7674		89.3366		317.96	74.7	N	P
Beryllium	75 - 125	7.7035		1.8526		7.95	73.6	N	P
Cadmium	75 - 125	6.1017		0.2445	B	7.95	73.7	N	P
Chromium	75 - 125	71.4566		45.4632		31.80	81.7		P
Cobalt	75 - 125	74.3793		9.9342		79.49	81.1		P
Copper	75 - 125	68.4952		42.1939		39.75	66.2	N	P
Lead		15.1485		12.9771		3.18	68.3		P
Manganese		556.5851		515.0889		79.49	52.2		P
Mercury	75 - 125	0.3336		0.0479	B	0.26	109.9		CV
Nickel	75 - 125	92.5176		32.9362		79.49	75.0		P
Selenium	75 - 125	2.3111		1.6762		1.59	39.9	N	P
Silver	75 - 125	7.1317		0.1113	U	7.95	89.7		P
Thallium	75 - 125	3.1603		0.8108	U	7.95	39.8	N	P
Vanadium	75 - 125	140.3536		73.2280		79.49	84.4		P
Zinc	75 - 125	111.7821		47.5196		79.49	80.8		P

Comments:

9
ICP SERIAL DILUTIONS

SAMPLE NO.

40SB3BL

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2788

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	226272.50		245927.00		8.7		P
Antimony	3.70	U	18.50	U			P
Arsenic	42.21		68.10		61.3		P
Barium	561.93		737.05		31.2	E	P
Beryllium	11.65		15.55	B	33.5	E	P
Cadmium	1.54	B	2.00	U	100.0		P
Calcium	10002.93		13616.11		36.1	E	P
Chromium	285.96		378.71		32.4	E	P
Cobalt	62.49		83.22		33.2	E	P
Copper	265.40		151.93		42.8	E	P
Iron	265023.81		359299.41		35.6	E	P
Lead	81.63		111.77		36.9		P
Magnesium	85034.05		112675.10		32.5	E	P
Manganese	3239.91		4365.34		34.7	E	P
Nickel	207.17		283.97		37.1	E	P
Potassium	16194.03		20588.77		27.1	E	P
Selenium	10.54		16.50	U	100.0		P
Silver	0.70	U	3.50	U			P
Sodium	1472.52	B	2173.95	B	47.6		P
Thallium	5.10	U	25.50	U			P
Vanadium	460.60		602.45		30.8	E	P
Zinc	298.90		415.37		39.0	E	P

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: _____T2788_____ **Fraction:_VOCs, SVOCs, Pest., PCBs, PAH,___ __Explosives, Nitroglycerin, Metals___**

Lab: _CompuChem_____ **Project Name: __Radford SWMU 40/71_____**

Reviewer: _____RA_____ **Date: _____February 24, 2003_(revision 1)___**

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the VOC analyses, severe loss of internal standards were observed in samples 40SB5A, 40SB5F, 40SB5C, 40SB4A, 40SB4F, and 40SB2F. All results were flagged "R,i" in these samples. These samples were re-analyzed with acceptable recoveries and results from the re-analyses should be used for these samples. For the metals analyses, the MS/MSD recoveries for copper (-46.41%/-62.5%) and thallium (5.4%/11.4%) were less than the lower QC limit (i.e., 75%). Positive copper results were previously flagged due to laboratory duplicate anomalies and no further data qualifying action was required. Non-detects were flagged "R,m " for copper and thallium in the associated samples.

Minor Anomalies: For the VOC analyses, the method blank analyzed on 11/28/02 contained toluene at 4 ug/Kg, 1,3-dichlorobenzene at 0.5 ug/Kg, 1,4-dichlorobenzene at 0.4 ug/Kg, 1,2-dichlorobenzne at 0.5 ug/Kg, and 1,2,4-trichlorobenzene at 4 ug/Kg. The method blank analyzed on 11/29/02 contained bromomethane at 1 ug/Kg, toluene at 2 ug/Kg, 1,3-dichlorobenzene at 0.3 ug/Kg, 1,4-dichlorobenzene at 0.3 ug/Kg, 1,2-dichlorobenzne at 0.3 ug/Kg, and 1,2,4-trichlorobenzne at 1 ug/Kg. The method blank analyzed on 12/3/02 contained methyl acetate at 100 ug/Kg. The method blank analyzed on 12/2/02 contained toluene at 3 ug/Kg, 1,3-dichlorobenzene at 0.3 ug/Kg, 1,4-dichlorobenzene at 0.3 ug/Kg, 1,2-dichlorobenzne at 0.2 ug/Kg, and 1,2,4-trichlorobenzne at 0.8 ug/Kg. Positive results less than 5 times the blank concentration were flagged "B,z" in the associated samples. The method blank also contained positive TIC results. These results were manually crossed out on the result forms by the reviewer in the associated samples. The trip and equipment blanks were located in SDG R2788. These blanks contained positive results for toluene and methylene chloride. Positive methylene chloride results less than 10 times the blank concentration were flagged "B,x" in the associated samples. Positive toluene results were previously flagged and no further data qualifying action was required.

Samples 40SB4FRE, 40SB4ARE, 40SB5ARE, 40SB5CRE, and 40SB5FRE were analyzed 4 or 5 days outside the holding time. These samples were re-analyzed since the original samples had low internal standards. Positive results were flagged "L,h" and non-detects were flagged "UL,h" unless previously flagged due to other anomalies.

The initial calibration analyzed on 1/28/02 displayed a %RSD greater than the control limit (i.e., 15%) for toluene at 25.4%. All associated sample results were previously flagged due to other anomalies and no further data qualifying action was required.

The CCV analyzed on 11/29/02 at 1124 displayed %Ds greater than the control limit (i.e., 20%) with a positive bias for chloroethane at 21.5%, acetone at 29.72%, styrene at 20.56%, 1,2-dibromo-3-chloropropane at 28.1%, and methylcyclohexane at 22.04%. Positive results were flagged "J,c" in the associated samples. The CCV analyzed on 12/2/02 at 1217 displayed %Ds greater than the control limit with a negative bias for bromomethane at 23.47%, carbon disulfide at 31.56%, and methyl acetate at 24.76%. All associated sample results were previously flagged due to other anomalies and no further data qualifying action was required. The CCV analyzed on 12/3/02 at 1100 displayed a %D greater than the control limit with a positive bias for trichlorofluoromethane at 21.53% and with a negative bias for carbon disulfide at 27.18% and methyl acetate at 21.12%. All associated sample results were previously flagged due to other anomalies and no further data qualifying action was required.

The recoveries for all surrogates were greater than the QC limit in samples 40SB5A, 40SB5F, 40SB5C, 40SB4A, and 40SB4F. These results were previously flagged due to internal standard anomalies. No further data qualifying action was required.

The MS/MSD recoveries for bromomethane (20%/19%), 1,2-dibromo-3-chloropropane (180%/190%), the MSD recoveries for carbon disulfide (31%), 4-methyl-2-pentanone (180%), 2-hexanone (170%), 1,1,2,2-tetrachloroethane (160%), and the RPD for chloroethane were outside the QC limit. The LCS recoveries were acceptable. This could be due to sample matrix interference. Bromomethane was flagged "UJ,m" and carbon disulfide was flagged "J,m" in the parent sample TESTPIT2F. No positive results were reported for the other compounds and no further data qualifying action was required.

The recoveries for internal standard 1,4-dichlorobenzene were less than the lower QC limit in samples TESTPIT2F and 40SB2FRE. All associated sample results were non-detects and were flagged "UJ,i".

For the SVOC analyses, equipment blanks located in SDG R2788 contained caprolactam at 21 ug/L and 22 ug/L. No positive results were reported and no data qualifying action was required.

The initial calibration analyzed on 11/25/02 displayed %RSDs greater than the control limit (i.e., 15%) for benzaldehyde at 18.7%, 2,4-dimethylphenol at 17.4%, hexachlorocyclopentadiene at 17.6%, n-nitrosodiphenylamine at 15.8%, and atrazine at 69.7%. Positive results were flagged "J,r" for benzaldehyde, 2,4-dimethylphenol, and hexachlorocyclopentadiene in the associated samples. Non-detects were flagged "UJ,r" for atrazine since the failure was serious enough (i.e., > 50%) to affect the non-detects.

The CCV analyzed on 11/29/02 at 2129 displayed a %D greater than the control limit (i.e., 20%) with a negative bias for atrazine at 58.3%. All associated sample results were previously flagged and no additional data qualifying action was required. The CCV analyzed on 12/9/02 at 1330 displayed %Ds greater than the control limit with a negative bias for 2-methylnaphthalene at 20.57%, hexachlorobenzene at 20.01% and atrazine at 54.31%. Positive results were flagged "J,c" and non-detects were flagged "UJ,c" unless previously flagged due to other anomalies.

The RPDs for the MS/MSD analyses were greater than the QC limits for benzaldehyde at 52%, 3-nitroaniline at 49%, and 3,3-dichlorobenzidine at 65%. The MS/MSD and LCS recoveries were acceptable and no data qualifying action was taken.

The bis(2-ethylhexyl)phthalate results were outside the QC limit for the field duplicate pair D-5/40SB1F. No action is required based on this failure and no data flags were applied.

For the pesticides analyses, the CCV analyzed on 12/11/02 displayed %Ds greater than the control limit (i.e., 15%) with a negative bias for 4,4-DDT at 16.27% and methoxychlor at 15.54%. All associated sample results were non-detects and were flagged "UJ,c."

The MS/MSD recoveries for beta-BHC (169%/157%), delta-BHC (12%/23%), 4,4-DDT (190%/167%), endosulfan sulfate (45%/38%), and endrin aldehyde (14%/18%), the MS recovery for alpha-BHC (48%), and the %RPD for delta-BHC (62%) were outside the QC limit. Non-detects were flagged "UJ,m" for delta-BHC, endosulfan sulfate, endrin aldehyde, and alpha-BHC in the parent sample TESTPIT2F. No positive results were reported for the other compounds and no further data qualifying action was taken.

The RPD between the two columns was greater than the QC limit (i.e., 40%) for aroclor-1254 in sample 71SS13 (47.8%). This result was flagged "J,g".

For the PCB analyses, the CCVs analyzed on 11/21/02 at 1656 and 2029 displayed %Ds greater than the control limit (i.e., 15%) with a positive bias for aroclor-1260 at 16.48% and 17.21%, respectively. The CCVs analyzed on 12/13/02 at 0942 and 1349 displayed %Ds greater than the control limit with a positive bias for aroclor-1260 at 18% and 21.4%, respectively. Positive results were flagged "J,c" in the associated samples.

The recovery for surrogate tetrachloro-m-xylene was greater than the upper QC limit in sample 40SB4F at 264%. No action is required based on one surrogate failure and no data flags were applied.

The %RPDs for aroclor-1254 (37%) and aroclor-1260 (63%) were greater than the control limit (i.e., 35%) for the field duplicate pair D-5/40SB1F. No action is required based on this failure and no data flags were applied.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for aroclor-1254 and aroclor-1016 in sample 40SB1F, aroclor-1254 in samples 40SB2F and 40SB4F, and aroclor-1260 in samples 71SB11F and D-5. These results were flagged "J,g."

For the PAH analyses, the CCV analyzed on 11/28/02 at 0225 displayed %Ds greater than the control limit (i.e., 15%) with a positive bias for acenaphthene at 16.39%, fluorene at 15.16%, and acenaphthylene at 15.18%. The CCV analyzed on 11/28/02 at 0937 displayed %Ds greater than the control limit with a positive bias for acenaphthene at 18.7%, dibenzo(a,h)anthracene at 15.2%, benzo(g,h,i)perylene at 17.72%, and acenaphthylene at 15.4%. The CCV analyzed on 12/01/02 at 1803 displayed %Ds greater than the control limit with a positive bias for pyrene at 15.03%, dibenzo(a,h)anthracene at 16.64%, benzo(g,h,i)perylene at 16.2%, and benzo(a)anthracene at 16.88%. The CCV analyzed on 12/02/02 at 0114 displayed %Ds greater than the control limit with a positive bias for pyrene at 16.15%, chrysene at 15.27%, benzo(b)fluoranthene at 15.82%, benzo(g,h,i)perylene at 17.69%, and benzo(a)pyrene at 19.7%. The CCV analyzed on 12/02/02 at 0750 displayed %Ds greater than the control limit with a positive bias for fluorene at 15.14%, benzo(k)fluoranthene at 18.16%, benzo(g,h,i)perylene at 18.63%, and benzo(a)pyrene at 22.78%. Positive results were flagged "J,c" in the associated samples.

The MS/MSD recoveries for all compounds except fluorene, phenenthrene, anthracene, and fluornathene were outside the QC limit. This could be due to sample matrix interference. All associated sample results were non-detects and were flagged "UJ,m" in the parent sample TESTPIT2F.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for several compounds in several samples. These results were flagged "J,g."

The %RPDs for acenaphthene (154%), benzo(a)anthracene (127%), and acenaphthylene (144%) were greater than the control limit (i.e., 35%) for the field duplicate pair D-5/40SB1F. No action is required based on this failure and no data flags were applied.

For the explosives analyses, the initial calibration analyzed on 12/3/02 displayed a %RSD greater than the QC limit (i.e., 15%) for RDX at 51.7%. All associated sample results were non-detects and were flagged "UJ,r."

The continuing calibration analyzed on 11/22/02 at 2331 displayed a %D greater than the QC limit (i.e., 20%) with a negative bias for 2,4,6-trinitrotoluene at 35.98%, and with a positive bias for 2,4-dinitrotoluene at 23.49%, 4-nitrotoluene at 21.96% and 3-nitrotoluene at 17.58%. The continuing calibration analyzed on 11/23/02 at 0909 displayed a %D greater than the QC limit with a negative bias for 2,4,6-trinitrotoluene at 18.95%, and with a positive bias for 1,3-dinitrobenzene at 23.32%, 2,4-dinitrotoluene at 32.01%, 4-amino-2,6-dinitrotoluene at 20.02%, 4-nitrotoluene at 29.3% and 3-nitrotoluene at 25.49%. The continuing calibration analyzed on 12/3/02 at 0612 displayed a %D greater than the QC limit with a negative bias for RDX at 30.2%. The continuing calibration analyzed on 12/3/02 at 1529 displayed a %D greater than the QC limit with a negative bias for RDX at 26.87% and with a positive bias for HMX at 27.02% and 2,4,6-trinitrotoluene at 20.87%. The continuing calibration analyzed on 12/4/02 at 0001 displayed a %D greater than the QC limit with a negative bias for RDX at 25.32% and with a positive bias for HMX at 28.96% and 2,4,6-trinitrotoluene at 25.78%. The continuing calibration analyzed on 12/4/02 at 0918 displayed a %D greater than the QC limit with a negative bias for RDX at –6.03%. All associated sample results were non-detects and were flagged "UJ,c" unless previously flagged due to other anomalies.

The MS/MSD recoveries for 2,4,6-trinitrotoluene (210%/155%) were greater than the upper QC limit (i.e., 150%). The 2,4,6-trinitrotoluene result in the parent sample TESTPIT2F was a non-detect and no data qualifying action was required. For the nitroglycerin analyses, the recovery for surrogate 1,4-dinitrobenzene was greater than the upper QC limit (i.e., 50%) in sample D-5 at 420%. This sample was re-analyzed with a similar recovery in sample D-5RR (420%). No positive results were reported and no data qualifying action was required. The original sample result should be used for data interpretation purposes.

For the metal analyses, the initial CRDL percent recoveries for aluminum (130%), arsenic (86.7%), copper (64.6%), nickel (119.8%), potassium (117.4%), selenium (126.4%), sodium (76.8%), and thallium (76.7%) were outside the control limit

(i.e., 90-110%). Positive results less than 2xCRDL were flagged "L,w" and non-detects were flagged "UL,w" for arsenic, copper, and sodium in the associated samples. Positive selenium results less than 2xCRDL were flagged "K,w" in the associated samples. Positive nickel and potassium results were greater than 2xCRDL and no data qualifying action was required. Thallium non-detects were previously flagged due to matrix spike failure and no further data qualifying action was required.

The method blanks contained positive results for barium, copper, magnesium, potassium, and zinc. All associated sample results were greater than 5 times the blank concentration and no data qualifying action was required. The equipment blanks located in SDG R2788 contained barium and sodium at low concentrations. All associated sample results were greater than 5 times the blank concentration and no data qualifying action was required. The initial and continuing calibration blanks also contained positive results for barium, magnesium, calcium, beryllium, copper, potassium, and a negative result for arsenic. All associated sample results were either greater than 5 times the blank concentration or were previously flagged. No further data qualifying action was required.

The laboratory duplicate results were outside the QC limit for all analytes except antimony, beryllium, potassium, silver, and antimony. Positive results were flagged "J,k" and non-detects were flagged "UJ,k" unless previously flagged due to other anomalies.

The MS/MSD recoveries for antimony (49.7%/60.1%) and the MS recovery for chromium (141.2%) were outside the control limit (i.e., 75-125%). Positive results were flagged "L,m" and non-detects were flagged "UL,m" for antimony. Positive chromium results were previously flagged due to laboratory duplicate anomalies and no further data qualifying action was required.

The serial dilution %D for potassium (10.4%) was greater than the QC limit (i.e., 10%). Positive results were flagged "J,s."

The %RPDs for arsenic (85%), iron (115%), magnesium (42%), manganese (44%), mercury (138%), nickel (38%), potassium (65%), selenium (138%), and vanadium (40%) were greater than the control limit (i.e., 35%) for the field duplicate pair D-5/40SB1F. No action is required based on this failure and no data flags were applied.

Correctable Anomalies: None.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were raised.

It should be noted that the positive TIC results were flagged "NJ,t" in the associated samples. Except for data flagged "R", all data, as qualified, are usable for their intended purpose, based on the data reviewed.

Signed: Ranjan

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-12

Sample wt/vol: 3.36(g/mL) G Lab File ID: T2788-12RA59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 18 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	9	U
74-87-3	Chloromethane	9	U
75-01-4	Vinyl Chloride	9	U
74-83-9	Bromomethane	9	U
75-00-3	Chloroethane	9	U
75-69-4	Trichlorofluoromethane	9	U
75-35-4	1,1-Dichloroethene	9	U
75-15-0	Carbon disulfide	3	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	9	U
67-64-1	Acetone	92	J,C
75-09-2	Methylene Chloride	9	U
156-60-5	trans-1,2-Dichloroethene	9	U
1634-04-4	Methyl-tert-butyl ether	9	U
75-34-3	1,1-Dichloroethane	9	U
156-59-2	cis-1,2-Dichloroethene	9	U
78-93-3	2-butanone	23	U
67-66-3	Chloroform	9	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
71-43-2	Benzene	9	U
107-06-2	1,2-Dichloroethane	9	U
79-01-6	Trichloroethene	3	J
78-87-5	1,2-Dichloropropane	9	U
75-27-4	Bromodichloromethane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
108-10-1	4-Methyl-2-pentanone	23	U
108-88-3	Toluene	2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	9	U
79-00-5	1,1,2-Trichloroethane	9	U
127-18-4	Tetrachloroethene	9	U
591-78-6	2-hexanone	23	U
124-48-1	Dibromochloromethane	9	U
106-93-4	1,2-Dibromoethane	9	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-12

Sample wt/vol: 3.36(g/mL) G Lab File ID: T2788-12RA59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 18 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	9	U
100-41-4	Ethylbenzene	9	U
100-42-5	Styrene	9	U
75-25-2	Bromoform	9	U
98-82-8	Isopropyl Benzene	9	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U
541-73-1	1,3-Dichlorobenzene	9	U
106-46-7	1,4-Dichlorobenzene	9	U
95-50-1	1,2-Dichlorobenzene	9	U
96-12-8	1,2-Dibromo-3-Chloropropane	9	U
120-82-1	1,2,4-Trichlorobenzene	9	U
1330-20-7	Xylene (total)	3	J
79-20-9	Methyl acetate	16	
110-82-7	Cyclohexane	9	U
108-87-2	Methylcyclohexane	9	U

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-12

Sample wt/vol: 3.36 (g/mL) G Lab File ID: T2788-12RA59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 18 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-6

Sample wt/vol: 4.73 (g/mL) G Lab File ID: T2788-6B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 28 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	0.9	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	120	
75-09-2	Methylene Chloride	4	J
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	18	U
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	1	J
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	4	J
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	18	U
108-88-3	Toluene	3	JB B,2
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	18	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-6

Sample wt/vol: 4.73 (g/mL) G Lab File ID: T2788-6B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 28 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	2	J
100-41-4	Ethylbenzene	7	U
100-42-5	Styrene	7	U
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	7	U
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	3	J
79-20-9	Methyl acetate	7	U
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB1B

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-6

Sample wt/vol: 4.73 (g/mL) G Lab File ID: T2788-6B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 28 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	60-29-7	ETHER	5.06	15.94	NJ
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-7

Sample wt/vol: 4.58(g/mL) G Lab File ID: T2788-7B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 30 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	2	J
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	8	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	8	U
67-64-1	Acetone	440	
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	53	
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	2	J
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	5	J
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	19	U
108-88-3	Toluene	2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	19	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-7

Sample wt/vol: 4.58(g/mL) G Lab File ID: T2788-7B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 30 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	8	U
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	2	J
79-20-9	Methyl acetate	18	
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB1C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-7

Sample wt/vol: 4.58 (g/mL) G Lab File ID: T2788-7B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 30 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-13

Sample wt/vol: 4.96(g/mL) G Lab File ID: T2788-13RA59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 45 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	9	U
74-87-3	Chloromethane	9	U
75-01-4	Vinyl Chloride	9	U
74-83-9	Bromomethane	9	U
75-00-3	Chloroethane	9	U
75-69-4	Trichlorofluoromethane	9	U
75-35-4	1,1-Dichloroethene	9	U
75-15-0	Carbon disulfide	10	
76-13-1	1,1,2-trichloro-1,2,2-triflu	9	U
67-64-1	Acetone	34	J,C
75-09-2	Methylene Chloride	9	U
156-60-5	trans-1,2-Dichloroethene	9	U
1634-04-4	Methyl-tert-butyl ether	9	U
75-34-3	1,1-Dichloroethane	9	U
156-59-2	cis-1,2-Dichloroethene	9	U
78-93-3	2-butanone	23	U
67-66-3	Chloroform	9	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
71-43-2	Benzene	15	
107-06-2	1,2-Dichloroethane	9	U
79-01-6	Trichloroethene	4	J
78-87-5	1,2-Dichloropropane	9	U
75-27-4	Bromodichloromethane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
108-10-1	4-Methyl-2-pentanone	23	U
108-88-3	Toluene	2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	9	U
79-00-5	1,1,2-Trichloroethane	9	U
127-18-4	Tetrachloroethene	9	U
591-78-6	2-hexanone	23	U
124-48-1	Dibromochloromethane	9	U
106-93-4	1,2-Dibromoethane	9	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-13

Sample wt/vol: 4.96(g/mL) G Lab File ID: T2788-13RA59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 45 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	9	U
100-41-4	Ethylbenzene	0.9	J
100-42-5	Styrene	9	U
75-25-2	Bromoform	9	U
98-82-8	Isopropyl Benzene	0.8	J
79-34-5	1,1,2,2-Tetrachloroethane	9	U
541-73-1	1,3-Dichlorobenzene	9	U
106-46-7	1,4-Dichlorobenzene	9	U
95-50-1	1,2-Dichlorobenzene	9	U
96-12-8	1,2-Dibromo-3-Chloropropane	9	U
120-82-1	1,2,4-Trichlorobenzene	9	U
1330-20-7	Xylene (total)	2	J
79-20-9	Methyl acetate	9	U
110-82-7	Cyclohexane	2	J
108-87-2	Methylcyclohexane	1	J J,C

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-13

Sample wt/vol: 4.96 (g/mL) G Lab File ID: T2788-13RA59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 45 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-8

Sample wt/vol: 5.28 (g/mL) G Lab File ID: T2788-8B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 18 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	6	U
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	U
75-15-0	Carbon disulfide	6	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	6	U
67-64-1	Acetone	160	
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl-tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-butanone	14	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
71-43-2	Benzene	6	U
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	3	J
78-87-5	1,2-Dichloropropane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	14	U
108-88-3	Toluene	2	JB
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-hexanone	14	U
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-8

Sample wt/vol: 5.28 (g/mL) G Lab File ID: T2788-8B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 18 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropyl Benzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-Chloropropane	6	U
120-82-1	1,2,4-Trichlorobenzene	6	U
1330-20-7	Xylene (total)	1	J
79-20-9	Methyl acetate	28	
110-82-7	Cyclohexane	6	U
108-87-2	Methylcyclohexane	6	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB2A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-8

Sample wt/vol: 5.28 (g/mL) G Lab File ID: T2788-8B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 18 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-10

Sample wt/vol: 4.61(g/mL) G Lab File ID: T2788-10B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 24 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	16	
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	130	
75-09-2	Methylene Chloride	3	J
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	18	U
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	7	U
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	5	J
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	18	U
108-88-3	Toluene	2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	18	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-10

Sample wt/vol: 4.61(g/mL) G Lab File ID: T2788-10B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 24 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	0.9	J
100-42-5	Styrene	7	U
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	7	U
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	9	J
79-20-9	Methyl acetate	7	U
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-10

Sample wt/vol: 4.61 (g/mL) G Lab File ID: T2788-10B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 24 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	60-29-7	ETHER	5.07	24.03	NJ NJ, t
2.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-11

Sample wt/vol: 4.67(g/mL) G Lab File ID: T2788-11B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 33 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	U
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	7	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	8	U
67-64-1	Acetone	160	
75-09-2	Methylene Chloride	4	J
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	20	U
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	8	U
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	5	J
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	20	U
108-88-3	Toluene	3	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	20	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-11

Sample wt/vol: 4.67(g/mL) G Lab File ID: T2788-11B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 33 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	6	J
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	43	
79-20-9	Methyl acetate	8	U
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-11

Sample wt/vol: 4.67 (g/mL) G Lab File ID: T2788-11B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 33 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	60-29-7	ETHER	5.08	146.2	NJ NJ, t
2.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 4.40(g/mL) G Lab File ID: T2788-9B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 23 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	7	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	37	
75-09-2	Methylene Chloride	1	J
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	18	U
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	2	J
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	3	J
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	18	U
108-88-3	Toluene	2	JB
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	18	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

RA

Do not use RA results from re-analysis

B,Z

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 4.40(g/mL) G Lab File ID: T2788-9B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 23 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	7	U
100-42-5	Styrene	7	U
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	7	U
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	2	J
79-20-9	Methyl acetate	7	U
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	7	U

Do not use RA 1/22/03

R,i

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
40SB2F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 4.40 (g/mL) G Lab File ID: T2788-9B59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 23 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		LABORATORY ARTIFACT	13.51	15.43	J NJF
2.		LABORATORY ARTIFACT	14.90	12.77	J ↓
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 2.37(g/mL) G Lab File ID: T2788-9RA59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 23 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	14	U
74-87-3	Chloromethane	14	U
75-01-4	Vinyl Chloride	14	U
74-83-9	Bromomethane	14	U
75-00-3	Chloroethane	14	U
75-69-4	Trichlorofluoromethane	14	U
75-35-4	1,1-Dichloroethene	14	U
75-15-0	Carbon disulfide	8	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	14	U
67-64-1	Acetone	36	J,C
75-09-2	Methylene Chloride	14	U
156-60-5	trans-1,2-Dichloroethene	14	U
1634-04-4	Methyl-tert-butyl ether	14	U
75-34-3	1,1-Dichloroethane	14	U
156-59-2	cis-1,2-Dichloroethene	14	U
78-93-3	2-butanone	34	U
67-66-3	Chloroform	14	U
71-55-6	1,1,1-Trichloroethane	14	U
56-23-5	Carbon Tetrachloride	14	U
71-43-2	Benzene	4	J
107-06-2	1,2-Dichloroethane	14	U
79-01-6	Trichloroethene	6	J
78-87-5	1,2-Dichloropropane	14	U
75-27-4	Bromodichloromethane	14	U
10061-01-5	cis-1,3-Dichloropropene	14	U
108-10-1	4-Methyl-2-pentanone	34	U
108-88-3	Toluene	5	JB B,E
10061-02-6	trans-1,3-Dichloropropene	14	U
79-00-5	1,1,2-Trichloroethane	14	U
127-18-4	Tetrachloroethene	14	U
591-78-6	2-hexanone	34	U
124-48-1	Dibromochloromethane	14	U
106-93-4	1,2-Dibromoethane	14	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 2.37(g/mL) G Lab File ID: T2788-9RA59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 23 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	14	U
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	14	U
75-25-2	Bromoform	14	U
98-82-8	Isopropyl Benzene	14	U
79-34-5	1,1,2,2-Tetrachloroethane	14	U UJ
541-73-1	1,3-Dichlorobenzene	14	U
106-46-7	1,4-Dichlorobenzene	14	U
95-50-1	1,2-Dichlorobenzene	14	U
96-12-8	1,2-Dibromo-3-Chloropropane	14	U
120-82-1	1,2,4-Trichlorobenzene	14	U UJ
1330-20-7	Xylene (total)	10	J
79-20-9	Methyl acetate	14	U
110-82-7	Cyclohexane	14	U
108-87-2	Methylcyclohexane	14	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB2FRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 2.37 (g/mL) G Lab File ID: T2788-9RA59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 23 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 3.73 (g/mL) G Lab File ID: T2788-4B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	U
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	8	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JK,S
67-64-1	Acetone	430	↓
75-09-2	Methylene Chloride	21	B,X
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	20	U
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	0.8	JK,S
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	14	K,S
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	20	U
108-88-3	Toluene	6	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	20	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

Do not use RA 1/22/03 use vacuum from re-dm

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 3.73 (g/mL) G Lab File ID: T2788-4B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	8	U
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	6	JK,S
79-20-9	Methyl acetate	8	U
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

Do not use RA 1,2-dichloroethane

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 3.73 (g/mL) G Lab File ID: T2788-4B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4ARE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 4.13(g/mL) G Lab File ID: T2788-4RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	1	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	120	
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	13	J
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	7	U
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	5	J
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	18	U
108-88-3	Toluene	2	JB
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	18	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4ARE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 4.13(g/mL) G Lab File ID: T2788-4RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	7	U
100-42-5	Styrene	7	U
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	7	U
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	1	J
79-20-9	Methyl acetate	14	
110-82-7	Cyclohexane	7	U
108-87-2	Methylcyclohexane	7	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4ARE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 4.13 (g/mL) G Lab File ID: T2788-4RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	CYCLOTETRASILOXANE, OCTAMETH	13.51	14.17	NJ NJT
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 5.01(g/mL) G Lab File ID: T2788-5B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
75-71-8	Dichlorodifluoromethane	3	J	K/S
74-87-3	Chloromethane	7	U	
75-01-4	Vinyl Chloride	7	U	
74-83-9	Bromomethane	3	J	K/S
75-00-3	Chloroethane	7	U	
75-69-4	Trichlorofluoromethane	7	U	
75-35-4	1,1-Dichloroethene	7	U	
75-15-0	Carbon disulfide	43		K/S
76-13-1	1,1,2-trichloro-1,2,2-triflu	15		
67-64-1	Acetone	470		
75-09-2	Methylene Chloride	10	B	B/Z
156-60-5	trans-1,2-Dichloroethene	7	U	
1634-04-4	Methyl-tert-butyl ether	7	U	
75-34-3	1,1-Dichloroethane	7	U	
156-59-2	cis-1,2-Dichloroethene	9		K/S
78-93-3	2-butanone	19	U	
67-66-3	Chloroform	7	U	
71-55-6	1,1,1-Trichloroethane	7	U	
56-23-5	Carbon Tetrachloride	7	U	
71-43-2	Benzene	86		K/S
107-06-2	1,2-Dichloroethane	7	U	
79-01-6	Trichloroethene	7	J	K/S
78-87-5	1,2-Dichloropropane	7	U	
75-27-4	Bromodichloromethane	7	U	
10061-01-5	cis-1,3-Dichloropropene	7	U	
108-10-1	4-Methyl-2-pentanone	19	U	
108-88-3	Toluene	17	B	B/Z
10061-02-6	trans-1,3-Dichloropropene	7	U	
79-00-5	1,1,2-Trichloroethane	7	U	
127-18-4	Tetrachloroethene	7	U	
591-78-6	2-hexanone	19	U	
124-48-1	Dibromochloromethane	7	U	
106-93-4	1,2-Dibromoethane	7	U	

Do not use RA 11/27/03

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 5.01(g/mL) G Lab File ID: T2788-5B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
108-90-7	Chlorobenzene	360	E	K/S
100-41-4	Ethylbenzene	27		
100-42-5	Styrene	0.6	J	
75-25-2	Bromoform	7	U	
98-82-8	Isopropyl Benzene	4	J	K/S
79-34-5	1,1,2,2-Tetrachloroethane	7	U	
541-73-1	1,3-Dichlorobenzene	7	U	
106-46-7	1,4-Dichlorobenzene	11	B	K/S
95-50-1	1,2-Dichlorobenzene	7	U	
96-12-8	1,2-Dibromo-3-Chloropropane	7	U	
120-82-1	1,2,4-Trichlorobenzene	7	U	
1330-20-7	Xylene (total)	77		K/S
79-20-9	Methyl acetate	7	U	
110-82-7	Cyclohexane	10		K/S
108-87-2	Methylcyclohexane	17		

Do not use FK 11/21/03

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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 5.01 (g/mL) G Lab File ID: T2788-5B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	74-93-1	METHANETHIOL	3.62	43.80	NJ
2.		UNKNOWN	14.03	37.63	J
3.		UNKNOWN	14.30	63.75	J
4.		UNKNOWN	14.73	34.35	J
5.		BRANCHED ALKANE	14.90	55.58	J
6.	124-19-6	NONANAL	15.14	57.56	NJ
7.		BRANCHED ALKANE	15.27	36.40	J
8.		BRANCHED ALKANE	15.58	38.93	J
9.		SUBSTITUTED BENZENE	15.88	34.18	J
10.		BRANCHED ALKANE	16.03	39.61	J
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 3.26(g/mL) G Lab File ID: T2788-5DA52

Level: (low/med) MED Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 12/03/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:(5000)(ul) Soil Aliquot Volume: 100(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	570	U UL,h
74-87-3	Chloromethane	570	U
75-01-4	Vinyl Chloride	570	U
74-83-9	Bromomethane	570	U
75-00-3	Chloroethane	570	U
75-69-4	Trichlorofluoromethane	570	U
75-35-4	1,1-Dichloroethene	570	U
75-15-0	Carbon disulfide	210	J L,h
76-13-1	1,1,2-trichloro-1,2,2-triflu	570	U UL,h
67-64-1	Acetone	1400	U
75-09-2	Methylene Chloride	340	J L,h
156-60-5	trans-1,2-Dichloroethene	570	U UL,h
1634-04-4	Methyl-tert-butyl ether	570	U
75-34-3	1,1-Dichloroethane	570	U
156-59-2	cis-1,2-Dichloroethene	570	U
78-93-3	2-butanone	1400	U
67-66-3	Chloroform	570	U
71-55-6	1,1,1-Trichloroethane	570	U
56-23-5	Carbon Tetrachloride	570	U
71-43-2	Benzene	600	L,h
107-06-2	1,2-Dichloroethane	570	U UL,h
79-01-6	Trichloroethene	570	U
78-87-5	1,2-Dichloropropane	570	U
75-27-4	Bromodichloromethane	570	U
10061-01-5	cis-1,3-Dichloropropene	570	U
108-10-1	4-Methyl-2-pentanone	1400	U
108-88-3	Toluene	390	J L,h
10061-02-6	trans-1,3-Dichloropropene	570	U UL,h
79-00-5	1,1,2-Trichloroethane	570	U
127-18-4	Tetrachloroethene	570	U
591-78-6	2-hexanone	1400	U
124-48-1	Dibromochloromethane	570	U
106-93-4	1,2-Dibromoethane	570	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 3.26(g/mL) G Lab File ID: T2788-5DA52

Level: (low/med) MED Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 12/03/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:(5000)(ul) Soil Aliquot Volume: 100(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	7100	L,h
100-41-4	Ethylbenzene	1100	↓
100-42-5	Styrene	570	U DL,h
75-25-2	Bromoform	570	U L
98-82-8	Isopropyl Benzene	180	J L,h
79-34-5	1,1,2,2-Tetrachloroethane	570	U DL,h
541-73-1	1,3-Dichlorobenzene	92	J L,h
106-46-7	1,4-Dichlorobenzene	670	↓
95-50-1	1,2-Dichlorobenzene	570	U DL,h
96-12-8	1,2-Dibromo-3-Chloropropane	570	U ↓
120-82-1	1,2,4-Trichlorobenzene	320	J L,h
1330-20-7	Xylene (total)	2400	↓
79-20-9	Methyl acetate	1100	B ↓
110-82-7	Cyclohexane	140	J
108-87-2	Methylcyclohexane	400	J ↓

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4FRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 3.26 (g/mL) G Lab File ID: T2788-5DA52

Level: (low/med) MED Date Received: 11/15/02

% Moisture: not dec. 33 Date Analyzed: 12/03/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5000(ul) Soil Aliquot Volume: 100(u

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		CYCLIC ALKANE	15.18	1296	J NJ
2.		BRANCHED ALKANE	15.39	1428	J
3.		CYCLIC ALKANE	15.65	1666	J
4.	99-87-6	BENZENE, 1-METHYL-4-(1-METHY	15.71	2261	NJ
5.	493-02-7	NAPHTHALENE, DECAHYDRO-, TRA	16.03	2302	NJ
6.		SUBSTITUTED BENZENE	17.07	1415	J
7.		SUBSTITUTED BENZENE	17.16	1796	J
8.		LABORATORY ARTIFACT	17.41	1755	J
9.	1559-81-5	NAPHTHALENE, 1,2,3,4-TETRAHY	17.71	1400	NJ
10.		UNKNOWN	17.98	1248	J
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 6.00(g/mL) G Lab File ID: T2788-1B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 17 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	3	J K/S
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	420	K/S
75-09-2	Methylene Chloride	9	B/Z
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	0.6	J K/S
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	8	K/S
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	4	JB B/Z
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

Do not use RA 1/22/03 Use results from re-analysis

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FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 6.00(g/mL) G Lab File ID: T2788-1B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 17 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	0.5	J
100-42-5	Styrene	0.6	J
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	0.6	JB
106-46-7	1,4-Dichlorobenzene	0.8	JB
95-50-1	1,2-Dichlorobenzene	0.8	JB
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	6	J
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

Do not use RA 112303

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use results from re-analysis

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB5A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 6.00 (g/mL) G Lab File ID: T2788-1B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 17 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5ARE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 4.79(g/mL) G Lab File ID: T2788-1R2A59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 17 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U UL,h
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	6	U
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	U
75-15-0	Carbon disulfide	6	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	6	U
67-64-1	Acetone	16	U
75-09-2	Methylene Chloride	1	J B,x
156-60-5	trans-1,2-Dichloroethene	6	U UL,h
1634-04-4	Methyl-tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-butanone	16	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
71-43-2	Benzene	6	U
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	0.6	J L,h
78-87-5	1,2-Dichloropropane	6	U UL,h
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	16	U
108-88-3	Toluene	0.8	JB Q, x
10061-02-6	trans-1,3-Dichloropropene	6	U UL,h
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-hexanone	16	U
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5ARE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 4.79(g/mL) G Lab File ID: T2788-1R2A59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 17 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	0.4	J L,h
100-41-4	Ethylbenzene	6	U U L,h
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropyl Benzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-Chloropropane	6	U
120-82-1	1,2,4-Trichlorobenzene	6	U
1330-20-7	Xylene (total)	19	U
79-20-9	Methyl acetate	6	U
110-82-7	Cyclohexane	6	U
108-87-2	Methylcyclohexane	6	U

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB5ARE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 4.79 (g/mL) G Lab File ID: T2788-1R2A59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 17 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 8.45(g/mL) G Lab File ID: T2788-3B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
75-71-8	Dichlorodifluoromethane		3	U
74-87-3	Chloromethane		3	U
75-01-4	Vinyl Chloride		3	U
74-83-9	Bromomethane		3	U
75-00-3	Chloroethane		3	U
75-69-4	Trichlorofluoromethane		3	U
75-35-4	1,1-Dichloroethene		3	U
75-15-0	Carbon disulfide		5	U K/S
76-13-1	1,1,2-trichloro-1,2,2-triflu		3	U
67-64-1	Acetone		130	K/S
75-09-2	Methylene Chloride		3	J B,Z
156-60-5	trans-1,2-Dichloroethene		3	U
1634-04-4	Methyl-tert-butyl ether		3	U
75-34-3	1,1-Dichloroethane		3	U
156-59-2	cis-1,2-Dichloroethene		3	U
78-93-3	2-butanone		9	U
67-66-3	Chloroform		3	U
71-55-6	1,1,1-Trichloroethane		3	U
56-23-5	Carbon Tetrachloride		3	U
71-43-2	Benzene		0.4	J K/S
107-06-2	1,2-Dichloroethane		3	U
79-01-6	Trichloroethene		5	U K/S
78-87-5	1,2-Dichloropropane		3	U
75-27-4	Bromodichloromethane		3	U
10061-01-5	cis-1,3-Dichloropropene		3	U
108-10-1	4-Methyl-2-pentanone		9	U
108-88-3	Toluene		2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene		3	U
79-00-5	1,1,2-Trichloroethane		3	U
127-18-4	Tetrachloroethene		3	U
591-78-6	2-hexanone		9	U
124-48-1	Dibromochloromethane		3	U
106-93-4	1,2-Dibromoethane		3	U

Do not use RA 1/23/03
use re-analysis results

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 8.45(g/mL) G Lab File ID: T2788-3B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	3	U
100-41-4	Ethylbenzene	3	U
100-42-5	Styrene	3	U
75-25-2	Bromoform	3	U
98-82-8	Isopropyl Benzene	3	U
79-34-5	1,1,2,2-Tetrachloroethane	3	U
541-73-1	1,3-Dichlorobenzene	3	U
106-46-7	1,4-Dichlorobenzene	3	U
95-50-1	1,2-Dichlorobenzene	3	U
96-12-8	1,2-Dibromo-3-Chloropropane	3	U
120-82-1	1,2,4-Trichlorobenzene	3	U
1330-20-7	Xylene (total)	1	JK,S
79-20-9	Methyl acetate	3	U
110-82-7	Cyclohexane	0.7	JK,S
108-87-2	Methylcyclohexane	3	U

Do not use 2-F 11/22/03

R,i

ug results from re-analysis

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB5C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 8.45 (g/mL) G Lab File ID: T2788-3B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		STRAIGHT-CHAIN ALKANE	2.89	7.10	J
2.	75-18-3	DIMETHYL SULFIDE	5.66	5.03	NJ
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4.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 2.65(g/mL) G Lab File ID: T2788-3RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	11	U
74-87-3	Chloromethane	11	U
75-01-4	Vinyl Chloride	11	U
74-83-9	Bromomethane	11	U
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	11	U
67-64-1	Acetone	64	
75-09-2	Methylene Chloride	3	J
156-60-5	trans-1,2-Dichloroethene	11	U
1634-04-4	Methyl-tert-butyl ether	11	U
75-34-3	1,1-Dichloroethane	11	U
156-59-2	cis-1,2-Dichloroethene	11	U
78-93-3	2-butanone	28	U
67-66-3	Chloroform	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
71-43-2	Benzene	11	U
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	7	J
78-87-5	1,2-Dichloropropane	11	U
75-27-4	Bromodichloromethane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-10-1	4-Methyl-2-pentanone	28	U
108-88-3	Toluene	3	JB
10061-02-6	trans-1,3-Dichloropropene	11	U
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
591-78-6	2-hexanone	28	U
124-48-1	Dibromochloromethane	11	U
106-93-4	1,2-Dibromoethane	11	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5CRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 2.65(g/mL) G Lab File ID: T2788-3RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	0.6	J
75-25-2	Bromoform	11	U
98-82-8	Isopropyl Benzene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	11	U
95-50-1	1,2-Dichlorobenzene	11	U
96-12-8	1,2-Dibromo-3-Chloropropane	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
1330-20-7	Xylene (total)	3	J
79-20-9	Methyl acetate	11	U
110-82-7	Cyclohexane	11	U
108-87-2	Methylcyclohexane	11	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB5CRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 2.65 (g/mL) G Lab File ID: T2788-3RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 15 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	2.90	16.92	J
2.					
3.					
4.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 3.87(g/mL) G Lab File ID: T2788-2B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 42 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	11	U
74-87-3	Chloromethane	11	U
75-01-4	Vinyl Chloride	11	U
74-83-9	Bromomethane	11	U
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-15-0	Carbon disulfide	110	
76-13-1	1,1,2-trichloro-1,2,2-triflu	3	J
67-64-1	Acetone	400	
75-09-2	Methylene Chloride	28	B,Z
156-60-5	trans-1,2-Dichloroethene	11	U
1634-04-4	Methyl-tert-butyl ether	11	U
75-34-3	1,1-Dichloroethane	11	U
156-59-2	cis-1,2-Dichloroethene	11	U
78-93-3	2-butanone	28	U
67-66-3	Chloroform	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
71-43-2	Benzene	3	J
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	17	
78-87-5	1,2-Dichloropropane	11	U
75-27-4	Bromodichloromethane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-10-1	4-Methyl-2-pentanone	28	U
108-88-3	Toluene	9	JB
10061-02-6	trans-1,3-Dichloropropene	11	U
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
591-78-6	2-hexanone	28	U
124-48-1	Dibromochloromethane	11	U
106-93-4	1,2-Dibromoethane	11	U

R

Do not use RA 1/22/03

K,S

B,Z

use re-analysis results

K,S

K,S

B,Z

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 3.87(g/mL) G Lab File ID: T2788-2B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 42 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	11	U
75-25-2	Bromoform	11	U
98-82-8	Isopropyl Benzene	2	J
79-34-5	1,1,2,2-Tetrachloroethane	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	2	JB
95-50-1	1,2-Dichlorobenzene	11	U
96-12-8	1,2-Dibromo-3-Chloropropane	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
1330-20-7	Xylene (total)	8	J
79-20-9	Methyl acetate	11	U
110-82-7	Cyclohexane	11	U
108-87-2	Methylcyclohexane	11	U

Do not use RA

B, E

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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 3.87 (g/mL) G Lab File ID: T2788-2B59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 42 Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		LABORATORY ARTIFACT	13.51	14.76	J NJ t
2.		BRANCHED ALKANE	14.04	15.38	J
3.	526-73-8	BENZENE, 1,2,3-TRIMETHYL-	14.17	17.73	NJ
4.		UNKNOWN	14.27	27.15	J
5.		UNKNOWN	14.31	11.43	J
6.		UNKNOWN	14.73	12.37	J
7.		LABORATORY ARTIFACT	14.90	17.90	J
8.		SUBSTITUTED BENZENE	15.29	23.95	J
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 4.81(g/mL) G Lab File ID: T2788-2RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 42 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	9	U UL,h
74-87-3	Chloromethane	9	U
75-01-4	Vinyl Chloride	9	U
74-83-9	Bromomethane	9	U
75-00-3	Chloroethane	9	U
75-69-4	Trichlorofluoromethane	9	U
75-35-4	1,1-Dichloroethene	9	U
75-15-0	Carbon disulfide	24	L,h
76-13-1	1,1,2-trichloro-1,2,2-triflu	9	U UL,h
67-64-1	Acetone	61	L,h
75-09-2	Methylene Chloride	2	J B,h
156-60-5	trans-1,2-Dichloroethene	9	U UL,h
1634-04-4	Methyl-tert-butyl ether	9	U
75-34-3	1,1-Dichloroethane	9	U
156-59-2	cis-1,2-Dichloroethene	9	U
78-93-3	2-butanone	22	U
67-66-3	Chloroform	9	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
71-43-2	Benzene	0.9	J L,h
107-06-2	1,2-Dichloroethane	9	U UL,h
79-01-6	Trichloroethene	4	J L,h
78-87-5	1,2-Dichloropropane	9	U UL,h
75-27-4	Bromodichloromethane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
108-10-1	4-Methyl-2-pentanone	22	U
108-88-3	Toluene	4	JB B,h
10061-02-6	trans-1,3-Dichloropropene	9	U UL,h
79-00-5	1,1,2-Trichloroethane	9	U
127-18-4	Tetrachloroethene	9	U
591-78-6	2-hexanone	22	U
124-48-1	Dibromochloromethane	9	U
106-93-4	1,2-Dibromoethane	9	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 4.81(g/mL) G Lab File ID: T2788-2RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 42 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	9	U UL, h
100-41-4	Ethylbenzene	2	J L, h
100-42-5	Styrene	9	U UL, h
75-25-2	Bromoform	9	U UL, h
98-82-8	Isopropyl Benzene	1	J L, h
79-34-5	1,1,2,2-Tetrachloroethane	9	U UL, h
541-73-1	1,3-Dichlorobenzene	9	U ↓
106-46-7	1,4-Dichlorobenzene	0.5	JB B, ≈
95-50-1	1,2-Dichlorobenzene	9	U UL, h
96-12-8	1,2-Dibromo-3-Chloropropane	9	U ↓
120-82-1	1,2,4-Trichlorobenzene	9	U ↓
1330-20-7	Xylene (total)	4	J L, h
79-20-9	Methyl acetate	9	U UL, h
110-82-7	Cyclohexane	9	U ↓
108-87-2	Methylcyclohexane	3	J L, h

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB5FRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 4.81 (g/mL) G Lab File ID: T2788-2RA59

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. 42 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	13.26	11.42	J NJ
2.		BRANCHED ALKANE	13.41	10.81	J
3.		BRANCHED ALKANE	14.03	16.10	J
4.	611-14-3	BENZENE, 1-ETHYL-2-METHYL-	14.17	16.82	NJ
5.		CYCLIC ALKANE	14.27	22.33	J
6.		CYCLIC ALKANE	14.32	17.61	J
7.	91-17-8	NAPHTHALENE, DECAHYDRO-	14.73	12.79	NJ
8.		SUBSTITUTED BENZENE	14.90	14.00	J
9.	1195-79-5	BICYCLO[2.2.1]HEPTAN-2-ONE,	15.29	20.54	NJ
10.	76-22-2	CAMPHOR	15.93	15.58	NJ
11.					
12.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-17

Sample wt/vol: 4.15(g/mL) G Lab File ID: T2788-17A59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 28 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	U
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	1	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	8	U
67-64-1	Acetone	110	J,C
75-09-2	Methylene Chloride	1	J
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	21	U
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	8	U
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	3	J
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	21	U
108-88-3	Toluene	2	JB B1 X
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	21	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-17

Sample wt/vol: 4.15(g/mL) G Lab File ID: T2788-17A59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 28 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	0.7	J
100-42-5	Styrene	0.4	J J, C
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	5	J
79-20-9	Methyl acetate	8	U
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SB11B

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-17

Sample wt/vol: 4.15 (g/mL) G Lab File ID: T2788-17A59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 28 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-18

Sample wt/vol: 4.41(g/mL) G Lab File ID: T2788-18A59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 30 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	U
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	8	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	8	U
67-64-1	Acetone	24	J,C
75-09-2	Methylene Chloride	1	J
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	20	U
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	8	U
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	3	J
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	15	J
108-88-3	Toluene	2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	20	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-18

Sample wt/vol: 4.41(g/mL) G Lab File ID: T2788-18A59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 30 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	8	U
100-42-5	Styrene	0.5	J JC
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	5	J
79-20-9	Methyl acetate	8	U
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SB11C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-18

Sample wt/vol: 4.41 (g/mL) G Lab File ID: T2788-18A59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 30 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		LABORATORY ARTIFACT	13.52	10.92	J NJit
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-16

Sample wt/vol: 3.50 (g/mL) G Lab File ID: T2788-16RA59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 20 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	9	U
74-87-3	Chloromethane	9	U
75-01-4	Vinyl Chloride	66	
74-83-9	Bromomethane	9	U
75-00-3	Chloroethane	9	U
75-69-4	Trichlorofluoromethane	9	U
75-35-4	1,1-Dichloroethene	9	U
75-15-0	Carbon disulfide	14	
76-13-1	1,1,2-trichloro-1,2,2-triflu	9	U
67-64-1	Acetone	140	JC
75-09-2	Methylene Chloride	9	U
156-60-5	trans-1,2-Dichloroethene	9	U
1634-04-4	Methyl-tert-butyl ether	9	U
75-34-3	1,1-Dichloroethane	9	U
156-59-2	cis-1,2-Dichloroethene	9	U
78-93-3	2-butanone	22	U
67-66-3	Chloroform	9	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
71-43-2	Benzene	9	U
107-06-2	1,2-Dichloroethane	9	U
79-01-6	Trichloroethene	2	J
78-87-5	1,2-Dichloropropane	9	U
75-27-4	Bromodichloromethane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
108-10-1	4-Methyl-2-pentanone	22	U
108-88-3	Toluene	2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	9	U
79-00-5	1,1,2-Trichloroethane	9	U
127-18-4	Tetrachloroethene	9	U
591-78-6	2-hexanone	22	U
124-48-1	Dibromochloromethane	9	U
106-93-4	1,2-Dibromoethane	9	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-16

Sample wt/vol: 3.50(g/mL) G Lab File ID: T2788-16RA59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 20 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	9	U
100-41-4	Ethylbenzene	9	U
100-42-5	Styrene	9	U
75-25-2	Bromoform	9	U
98-82-8	Isopropyl Benzene	9	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U
541-73-1	1,3-Dichlorobenzene	9	U
106-46-7	1,4-Dichlorobenzene	9	U
95-50-1	1,2-Dichlorobenzene	9	U
96-12-8	1,2-Dibromo-3-Chloropropane	9	U
120-82-1	1,2,4-Trichlorobenzene	9	U
1330-20-7	Xylene (total)	5	J
79-20-9	Methyl acetate	9	U
110-82-7	Cyclohexane	9	U
108-87-2	Methylcyclohexane	0.9	J

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-16

Sample wt/vol: 3.50 (g/mL) G Lab File ID: T2788-16RA59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 20 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume:_____(

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	95-36-3	1,2,4-TRIMETHYLBENZENE	14.18	9.76	NJ NJ
2.					
3.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-15

Sample wt/vol: 4.58(g/mL) G Lab File ID: T2788-15RA59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 6 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	2	JB B,Z
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	U
75-15-0	Carbon disulfide	4	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	6	U
67-64-1	Acetone	54	J C
75-09-2	Methylene Chloride	6	U
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl-tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-butanone	15	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
71-43-2	Benzene	6	U
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	1	J
78-87-5	1,2-Dichloropropane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	15	U
108-88-3	Toluene	1	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-hexanone	15	U
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-15

Sample wt/vol: 4.58(g/mL) G Lab File ID: T2788-15RA59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 6 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropyl Benzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-Chloropropane	6	U
120-82-1	1,2,4-Trichlorobenzene	6	U
1330-20-7	Xylene (total)	2	J
79-20-9	Methyl acetate	6	U
110-82-7	Cyclohexane	6	U
108-87-2	Methylcyclohexane	6	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-15

Sample wt/vol: 4.58 (g/mL) G Lab File ID: T2788-15RA59

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. 6 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-5

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 3.16(g/mL) G Lab File ID: T2788-14A59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 27 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	11	U
74-87-3	Chloromethane	11	U
75-01-4	Vinyl Chloride	11	U
74-83-9	Bromomethane	11	U
75-00-3	Chloroethane	11	U
75-69-4	Trichlorofluoromethane	11	U
75-35-4	1,1-Dichloroethene	11	U
75-15-0	Carbon disulfide	2	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	11	U
67-64-1	Acetone	37	J,C
75-09-2	Methylene Chloride	3	J
156-60-5	trans-1,2-Dichloroethene	11	U
1634-04-4	Methyl-tert-butyl ether	11	U
75-34-3	1,1-Dichloroethane	11	U
156-59-2	cis-1,2-Dichloroethene	11	U
78-93-3	2-butanone	27	U
67-66-3	Chloroform	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
71-43-2	Benzene	12	
107-06-2	1,2-Dichloroethane	11	U
79-01-6	Trichloroethene	7	J
78-87-5	1,2-Dichloropropane	11	U
75-27-4	Bromodichloromethane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
108-10-1	4-Methyl-2-pentanone	27	U
108-88-3	Toluene	3	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	11	U
79-00-5	1,1,2-Trichloroethane	11	U
127-18-4	Tetrachloroethene	11	U
591-78-6	2-hexanone	27	U
124-48-1	Dibromochloromethane	11	U
106-93-4	1,2-Dibromoethane	11	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-5

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 3.16(g/mL) G Lab File ID: T2788-14A59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 27 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	0.3	J J,C
75-25-2	Bromoform	11	U
98-82-8	Isopropyl Benzene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	11	U
95-50-1	1,2-Dichlorobenzene	11	U
96-12-8	1,2-Dibromo-3-Chloropropane	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
1330-20-7	Xylene (total)	2	J
79-20-9	Methyl acetate	8	J
110-82-7	Cyclohexane	11	U
108-87-2	Methylcyclohexane	11	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-5

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 3.16 (g/mL) G Lab File ID: T2788-14A59

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. 27 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT2BP

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-20

Sample wt/vol: 4.03(g/mL) G Lab File ID: T2788-20A59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 25 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	U
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	3	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	8	U
67-64-1	Acetone	35	JC
75-09-2	Methylene Chloride	0.9	J
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	21	U
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	8	U
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	8	U
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	21	U
108-88-3	Toluene	2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	21	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT2BP

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-20

Sample wt/vol: 4.03 (g/mL) G Lab File ID: T2788-20A59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 25 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	8	U
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	0.8	JB
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	2	J
79-20-9	Methyl acetate	8	U
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT2BP

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-20

Sample wt/vol: 4.03 (g/mL) G Lab File ID: T2788-20A59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 25 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-19

Sample wt/vol: 1.99(g/mL) G Lab File ID: T2788-19A59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 20 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	16	U
74-87-3	Chloromethane	16	U
75-01-4	Vinyl Chloride	16	U
74-83-9	Bromomethane	16	U UJ,m
75-00-3	Chloroethane	16	U
75-69-4	Trichlorofluoromethane	16	U
75-35-4	1,1-Dichloroethene	16	U
75-15-0	Carbon disulfide	3	J J,m
76-13-1	1,1,2-trichloro-1,2,2-triflu	16	U
67-64-1	Acetone	57	J,C
75-09-2	Methylene Chloride	16	U
156-60-5	trans-1,2-Dichloroethene	16	U
1634-04-4	Methyl-tert-butyl ether	16	U
75-34-3	1,1-Dichloroethane	5	J
156-59-2	cis-1,2-Dichloroethene	16	U
78-93-3	2-butanone	39	U
67-66-3	Chloroform	16	U
71-55-6	1,1,1-Trichloroethane	16	U
56-23-5	Carbon Tetrachloride	16	U
71-43-2	Benzene	9	J
107-06-2	1,2-Dichloroethane	16	U
79-01-6	Trichloroethene	16	U
78-87-5	1,2-Dichloropropane	16	U
75-27-4	Bromodichloromethane	16	U
10061-01-5	cis-1,3-Dichloropropene	16	U
108-10-1	4-Methyl-2-pentanone	39	U
108-88-3	Toluene	8	JB B,z
10061-02-6	trans-1,3-Dichloropropene	16	U
79-00-5	1,1,2-Trichloroethane	16	U
127-18-4	Tetrachloroethene	16	U
591-78-6	2-hexanone	39	U
124-48-1	Dibromochloromethane	16	U
106-93-4	1,2-Dibromoethane	16	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-19

Sample wt/vol: 1.99(g/mL) G Lab File ID: T2788-19A59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 20 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	16	U
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	16	U
75-25-2	Bromoform	16	U
98-82-8	Isopropyl Benzene	16	U
79-34-5	1,1,2,2-Tetrachloroethane	16	U UJ
541-73-1	1,3-Dichlorobenzene	16	U
106-46-7	1,4-Dichlorobenzene	16	U
95-50-1	1,2-Dichlorobenzene	16	U
96-12-8	1,2-Dibromo-3-Chloropropane	16	U
120-82-1	1,2,4-Trichlorobenzene	16	U
1330-20-7	Xylene (total)	10	J
79-20-9	Methyl acetate	16	U
110-82-7	Cyclohexane	16	U
108-87-2	Methylcyclohexane	16	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-19

Sample wt/vol: 1.99 (g/mL) G Lab File ID: T2788-19A59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 20 Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	CYCLOTETRASILOXANE, OCTAMETH	13.53	27.9	NJ NJ
2.		LABORATORY ARTIFACT	14.91	22.67	J
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FORM I VOA-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
40SB1A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-12RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	66	J J,Y
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	45	J J,C
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-12RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U UJ,C
1912-24-9	Atrazine	400	U UJ,r
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	73	J
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	92	J
206-44-0	Fluoranthene	46	J
129-00-0	Pyrene	51	J
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	120	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	68	J
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-12RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.66~~	~~980~~	~~JB~~
2.		UNKNOWN	9.95	340	J
3.		BRANCHED ALKANE	10.79	550	J
4.	106-02-5	OXACYCLOHEXADECAN-2-ONE	12.60	400	NJ
5.		UNKNOWN	12.68	320	J
6.	57-10-3	HEXADECANOIC ACID	12.78	530	NJ
7.	10544-50-0	SULFUR, MOL. (S8)	14.10	1900	NJ
8.		UNKNOWN PAH	15.71	1100	J
9.		UNKNOWN	15.79	420	J
10.	1740-19-8	1-PHENANTHRENECARBOXYLIC ACI	16.70	2900	NJ
11.	1740-19-8	1-PHENANTHRENECARBOXYLIC ACI	17.50	3900	NJ
12.		STRAIGHT-CHAIN ALKANE	18.88	440	J
13.		UNKNOWN	20.23	420	J
14.		STRAIGHT-CHAIN ALKANE	20.45	360	J
15.	34444-37-6	(-)-NORTRACHELOGENIN	21.50	4200	NJ
16.		UNKNOWN	22.18	590	J
17.		UNKNOWN	22.28	480	J
18.		UNKNOWN	22.46	370	J
19.		UNKNOWN	23.07	350	J
20.		UNKNOWN	23.12	470	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-6RB64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 28 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	460	U
108-95-2	Phenol	460	U
111-44-4	Bis(2-chloroethyl)ether	460	U
95-57-8	2-Chlorophenol	460	U
95-48-7	2-Methylphenol	460	U
108-60-1	2,2'-oxybis(1-Chloropropane)	460	U
98-86-2	Acetophenone	460	U
106-44-5	4-Methylphenol	460	U
621-64-7	N-Nitroso-di-N-propylamine	460	U
67-72-1	Hexachloroethane	460	U
98-95-3	Nitrobenzene	460	U
78-59-1	Isophcrone	460	U
88-75-5	2-Nitrophenol	460	U
105-67-9	2,4-Dimethylphenol	460	U
111-91-1	Bis(2-chloroethoxy)methane	460	U
120-83-2	2,4-Dichlorophenol	460	U
91-20-3	Naphthalene	460	U
106-47-8	4-Chloroaniline	460	U
87-68-3	Hexachlorobutadiene	460	U
105-60-2	Caprolactam	460	U
59-50-7	4-Chloro-3-methylphenol	460	U
91-57-6	2-Methylnaphthalene	460	U
77-47-4	Hexachlorocyclopentadiene	460	U
88-06-2	2,4,6-Trichlorophenol	460	U
95-95-4	2,4,5-Trichlorophenol	460	U
92-52-4	1,1'-Biphenyl	460	U
91-58-7	2-Chloronaphthalene	460	U
88-74-4	2-Nitroaniline	920	U
131-11-3	Dimethylphthalate	460	U
606-20-2	2,6-Dinitrotoluene	460	U
208-96-8	Acenaphthylene	460	U
99-09-2	3-Nitroaniline	920	U
83-32-9	Acenaphthene	460	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-6RB64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 28 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2300	U
100-02-7	4-Nitrophenol	920	U
121-14-2	2,4-Dinitrotoluene	460	U
132-64-9	Dibenzofuran	460	U
84-66-2	Diethylphthalate	460	U
7005-72-3	4-Chlorophenyl-phenylether	460	U
86-73-7	Fluorene	460	U
100-01-6	4-Nitroaniline	920	U
534-52-1	4,6-Dinitro-2-methylphenol	920	U
86-30-6	N-Nitrosodiphenylamine (1)	250	J UJ,r
101-55-3	4-Bromophenyl-phenylether	460	U
118-74-1	Hexachlorobenzene	460	U
1912-24-9	Atrazine	460	U UJ,r
87-86-5	Pentachlorophenol	460	U
85-01-8	Phenanthrene	460	U
120-12-7	Anthracene	460	U
86-74-8	Carbazole	460	U
84-74-2	Di-n-butylphthalate	460	U
206-44-0	Fluoranthene	460	U
129-00-0	Pyrene	460	U
85-68-7	Butylbenzylphthalate	460	U
91-94-1	3,3'-Dichlorobenzidine	460	U
117-81-7	bis(2-ethylhexyl)Phthalate	95	J
56-55-3	Benzo(a)anthracene	460	U
218-01-9	Chrysene	460	U
117-84-0	Di-n-octylphthalate	460	U
205-99-2	Benzo(b)fluoranthene	460	U
207-08-9	Benzo(k)fluoranthene	460	U
50-32-8	Benzo(a)pyrene	460	U
193-39-5	Indeno(1,2,3-cd)pyrene	460	U
53-70-3	Dibenzo(a,h)anthracene	460	U
191-24-2	Benzo(g,h,i)perylene	460	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
40SB1B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-6RB64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 28 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.42~~	~~190~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.71~~	~~1100~~	~~JB~~
3.		UNKNOWN	9.96	190	J
4.	57-10-3	HEXADECANOIC ACID	12.89	990	NJ
5.	10544-50-0	SULFUR, MOL. (S8)	14.20	1100	NJ
6.	1002-84-2	PENTADECANOIC ACID	15.07	210	NJ
7.		~~UNKNOWN (BC)~~	~~17.52~~	~~310~~	~~JB~~
8.		UNKNOWN	17.62	1000	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-7

Sample wt/vol: 15.0 (g/mL) G Lab File ID: T2788-7RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 500(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	470	U
108-95-2	Phenol	470	U
111-44-4	Bis(2-chloroethyl)ether	470	U
95-57-8	2-Chlorophenol	470	U
95-48-7	2-Methylphenol	470	U
108-60-1	2,2'-oxybis(1-Chloropropane)	470	U
98-86-2	Acetophenone	470	U
106-44-5	4-Methylphenol	470	U
621-64-7	N-Nitroso-di-N-propylamine	470	U
67-72-1	Hexachloroethane	470	U
98-95-3	Nitrobenzene	470	U
78-59-1	Isophorone	470	U
88-75-5	2-Nitrophenol	470	U
105-67-9	2,4-Dimethylphenol	470	U
111-91-1	Bis(2-chloroethoxy)methane	470	U
120-83-2	2,4-Dichlorophenol	470	U
91-20-3	Naphthalene	470	U
106-47-8	4-Chloroaniline	470	U
87-68-3	Hexachlorobutadiene	470	U
105-60-2	Caprolactam	470	U
59-50-7	4-Chloro-3-methylphenol	470	U
91-57-6	2-Methylnaphthalene	470	UJ,C
77-47-4	Hexachlorocyclopentadiene	470	U
88-06-2	2,4,6-Trichlorophenol	470	U
95-95-4	2,4,5-Trichlorophenol	470	U
92-52-4	1,1'-Biphenyl	470	U
91-58-7	2-Chloronaphthalene	470	U
88-74-4	2-Nitroaniline	940	U
131-11-3	Dimethylphthalate	470	U
606-20-2	2,6-Dinitrotoluene	470	U
208-96-8	Acenaphthylene	470	U
99-09-2	3-Nitroaniline	940	U
83-32-9	Acenaphthene	470	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-7

Sample wt/vol: 15.0 (g/mL) G Lab File ID: T2788-7RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 500(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2400	U
100-02-7	4-Nitrophenol	940	U
121-14-2	2,4-Dinitrotoluene	470	U
132-64-9	Dibenzofuran	470	U
84-66-2	Diethylphthalate	470	U
7005-72-3	4-Chlorophenyl-phenylether	470	U
86-73-7	Fluorene	470	U
100-01-6	4-Nitroaniline	940	U
534-52-1	4,6-Dinitro-2-methylphenol	940	U
86-30-6	N-Nitrosodiphenylamine (1)	470	U
101-55-3	4-Bromophenyl-phenylether	470	U
118-74-1	Hexachlorobenzene	470	U UJ,C
1912-24-9	Atrazine	470	U UJ,r
87-86-5	Pentachlorophenol	470	U
85-01-8	Phenanthrene	470	U
120-12-7	Anthracene	470	U
86-74-8	Carbazole	470	U
84-74-2	Di-n-butylphthalate	470	U
206-44-0	Fluoranthene	470	U
129-00-0	Pyrene	470	U
85-68-7	Butylbenzylphthalate	470	U
91-94-1	3,3'-Dichlorobenzidine	470	U
117-81-7	bis(2-ethylhexyl)Phthalate	190	J
56-55-3	Benzo(a)anthracene	470	U
218-01-9	Chrysene	470	U
117-84-0	Di-n-octylphthalate	420	J
205-99-2	Benzo(b)fluoranthene	470	U
207-08-9	Benzo(k)fluoranthene	470	U
50-32-8	Benzo(a)pyrene	470	U
193-39-5	Indeno(1,2,3-cd)pyrene	470	U
53-70-3	Dibenzo(a,h)anthracene	470	U
191-24-2	Benzo(g,h,i)perylene	470	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB1C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-7

Sample wt/vol: 15.0 (g/mL) G Lab File ID: T2788-7RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 500(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 19

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.36~~	~~420~~	~~JB~~
2.		~~UNKNOWN (BC)~~	5.68	3000	JB
3.		UNKNOWN	6.93	410	J
4.		UNKNOWN	7.45	230	J
5.		UNKNOWN	13.21	240	J
6.	123-79-5	HEXANEDIOIC ACID, DIOCTYL ES	16.98	250	NJ
7.		UNKNOWN PHTHALATE	18.89	360	J
8.	28553-12-0	1,2-BENZENEDICARBOXYLIC ACID	19.01	340	NJ
9.		UNKNOWN PHTHALATE	19.31	640	J
10.		UNKNOWN	19.40	470	J
11.		UNKNOWN PHTHALATE	19.45	800	J
12.		UNKNOWN	19.63	350	J
13.		UNKNOWN PHTHALATE	19.68	500	J
14.		UNKNOWN PHTHALATE	19.77	660	J
15.		UNKNOWN PHTHALATE	19.82	390	J
16.		UNKNOWN PHTHALATE	19.97	300	J
17.		UNKNOWN	22.17	620	J
18.		UNKNOWN	23.06	380	J
19.		UNKNOWN	23.11	720	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-13RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 45 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
100-52-7	Benzaldehyde	600	U	
108-95-2	Phenol	600	U	
111-44-4	Bis(2-chloroethyl)ether	600	U	
95-57-8	2-Chlorophenol	600	U	
95-48-7	2-Methylphenol	600	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	600	U	
98-86-2	Acetophenone	600	U	
106-44-5	4-Methylphenol	600	U	
621-64-7	N-Nitroso-di-N-propylamine	600	U	
67-72-1	Hexachloroethane	600	U	
98-95-3	Nitrobenzene	600	U	
78-59-1	Isophorone	600	U	
88-75-5	2-Nitrophenol	600	U	
105-67-9	2,4-Dimethylphenol	600	U	
111-91-1	Bis(2-chloroethoxy)methane	600	U	
120-83-2	2,4-Dichlorophenol	600	U	
91-20-3	Naphthalene	600	U	
106-47-8	4-Chloroaniline	600	U	
87-68-3	Hexachlorobutadiene	600	U	
105-60-2	Caprolactam	600	U	
59-50-7	4-Chloro-3-methylphenol	600	U	
91-57-6	2-Methylnaphthalene	64	J	J/C
77-47-4	Hexachlorocyclopentadiene	600	U	
88-06-2	2,4,6-Trichlorophenol	600	U	
95-95-4	2,4,5-Trichlorophenol	600	U	
92-52-4	1,1'-Biphenyl	42	J	
91-58-7	2-Chloronaphthalene	600	U	
88-74-4	2-Nitroaniline	1200	U	
131-11-3	Dimethylphthalate	600	U	
606-20-2	2,6-Dinitrotoluene	600	U	
208-96-8	Acenaphthylene	600	U	
99-09-2	3-Nitroaniline	1200	U	
83-32-9	Acenaphthene	600	U	

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-13RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 45 decanted: (Y/N) N Date Extracted: 11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	3000	U
100-02-7	4-Nitrophenol	1200	U
121-14-2	2,4-Dinitrotoluene	41	J
132-64-9	Dibenzofuran	600	U
84-66-2	Diethylphthalate	600	U
7005-72-3	4-Chlorophenyl-phenylether	600	U
86-73-7	Fluorene	600	U
100-01-6	4-Nitroaniline	1200	U
534-52-1	4,6-Dinitro-2-methylphenol	1200	U
86-30-6	N-Nitrosodiphenylamine (1)	390	UJ,r
101-55-3	4-Bromophenyl-phenylether	600	U
118-74-1	Hexachlorobenzene	600	U UJ,c
1912-24-9	Atrazine	600	U UJ,r
87-86-5	Pentachlorophenol	600	U
85-01-8	Phenanthrene	55	J
120-12-7	Anthracene	600	U
86-74-8	Carbazole	600	U
84-74-2	Di-n-butylphthalate	720	
206-44-0	Fluoranthene	600	U
129-00-0	Pyrene	600	U
85-68-7	Butylbenzylphthalate	600	U
91-94-1	3,3'-Dichlorobenzidine	600	U
117-81-7	bis(2-ethylhexyl)Phthalate	4200	
56-55-3	Benzo(a)anthracene	600	U
218-01-9	Chrysene	600	U
117-84-0	Di-n-octylphthalate	600	U
205-99-2	Benzo(b)fluoranthene	600	U
207-08-9	Benzo(k)fluoranthene	600	U
50-32-8	Benzo(a)pyrene	600	U
193-39-5	Indeno(1,2,3-cd)pyrene	600	U
53-70-3	Dibenzo(a,h)anthracene	600	U
191-24-2	Benzo(g,h,i)perylene	600	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-13RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 45 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.66~~	~~1900~~	~~JB~~
2.	10544-50-0	SULFUR, MOL. (S8)	14.16	12000	NJ
3.		UNKNOWN	14.58	2300	J
4.		UNKNOWN	15.02	1600	J
5.		STRAIGHT-CHAIN ALKANE	15.32	1400	J
6.	483-65-8	PHENANTHRENE, 1-METHYL-7-(1-	15.69	750	NJ
7.		STRAIGHT-CHAIN ALKANE	16.18	2200	J
8.		STRAIGHT-CHAIN ALKANE	16.96	3500	J
9.		UNKNOWN	17.15	890	J
10.	1740-19-8	1-PHENANTHRENECARBOXYLIC ACI	17.43	1000	NJ
11.		STRAIGHT-CHAIN ALKANE	17.67	4800	J
12.		UNKNOWN PHTHALATE	17.94	2300	J
13.		STRAIGHT-CHAIN ALKANE	18.31	5200	J
14.		STRAIGHT-CHAIN ALKANE	18.89	5900	J
15.		STRAIGHT-CHAIN ALKANE	19.44	5200	J
16.		STRAIGHT-CHAIN ALKANE	19.97	4900	J
17.		BRANCHED ALKANE	20.46	3800	J
18.		STRAIGHT-CHAIN ALKANE	20.93	3300	J
19.		BRANCHED ALKANE	21.39	2200	J
20.		BRANCHED ALKANE	21.83	1300	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-8RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U UJ,C
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-8RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U UJ,C
1912-24-9	Atrazine	400	U UJ,Y
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	98	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
40SB2A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-8RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.37~~	~~170~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.64~~	~~1400~~	~~JB~~
3.	10544-50-0	SULFUR, MOL. (S8)	14.09	500	NJ NJ
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-10RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 24 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
100-52-7	Benzaldehyde	430	U	
108-95-2	Phenol	430	U	
111-44-4	Bis(2-chloroethyl)ether	430	U	
95-57-8	2-Chlorophenol	430	U	
95-48-7	2-Methylphenol	430	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	430	U	
98-86-2	Acetophenone	430	U	
106-44-5	4-Methylphenol	430	U	
621-64-7	N-Nitroso-di-N-propylamine	430	U	
67-72-1	Hexachloroethane	430	U	
98-95-3	Nitrobenzene	430	U	
78-59-1	Isophorone	430	U	
88-75-5	2-Nitrophenol	430	U	
105-67-9	2,4-Dimethylphenol	430	U	
111-91-1	Bis(2-chloroethoxy)methane	430	U	
120-83-2	2,4-Dichlorophenol	430	U	
91-20-3	Naphthalene	430	U	
106-47-8	4-Chloroaniline	430	U	
87-68-3	Hexachlorobutadiene	430	U	
105-60-2	Caprolactam	430	U	
59-50-7	4-Chloro-3-methylphenol	430	U	
91-57-6	2-Methylnaphthalene	430	U	UJ/C
77-47-4	Hexachlorocyclopentadiene	430	U	
88-06-2	2,4,6-Trichlorophenol	430	U	
95-95-4	2,4,5-Trichlorophenol	430	U	
92-52-4	1,1'-Biphenyl	430	U	
91-58-7	2-Chloronaphthalene	430	U	
88-74-4	2-Nitroaniline	870	U	
131-11-3	Dimethylphthalate	430	U	
606-20-2	2,6-Dinitrotoluene	430	U	
208-96-8	Acenaphthylene	430	U	
99-09-2	3-Nitroaniline	870	U	
83-32-9	Acenaphthene	430	U	

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-10RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 24 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	870	U
121-14-2	2,4-Dinitrotoluene	430	U
132-64-9	Dibenzofuran	430	U
84-66-2	Diethylphthalate	430	U
7005-72-3	4-Chlorophenyl-phenylether	430	U
86-73-7	Fluorene	430	U
100-01-6	4-Nitroaniline	870	U
534-52-1	4,6-Dinitro-2-methylphenol	870	U
86-30-6	N-Nitrosodiphenylamine (1)	430	U
101-55-3	4-Bromophenyl-phenylether	430	U
118-74-1	Hexachlorobenzene	430	U UJ/C
1912-24-9	Atrazine	430	U UJ, R
87-86-5	Pentachlorophenol	430	U
85-01-8	Phenanthrene	430	U
120-12-7	Anthracene	430	U
86-74-8	Carbazole	430	U
84-74-2	Di-n-butylphthalate	430	U
206-44-0	Fluoranthene	430	U
129-00-0	Pyrene	430	U
85-68-7	Butylbenzylphthalate	430	U
91-94-1	3,3'-Dichlorobenzidine	430	U
117-81-7	bis(2-ethylhexyl)Phthalate	51	J
56-55-3	Benzo(a)anthracene	430	U
218-01-9	Chrysene	430	U
117-84-0	Di-n-octylphthalate	63	J
205-99-2	Benzo(b)fluoranthene	430	U
207-08-9	Benzo(k)fluoranthene	430	U
50-32-8	Benzo(a)pyrene	430	U
193-39-5	Indeno(1,2,3-cd)pyrene	430	U
53-70-3	Dibenzo(a,h)anthracene	430	U
191-24-2	Benzo(g,h,i)perylene	430	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
40SB2B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-10RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 24 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.37~~	~~190~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.65~~	~~1300~~	~~JB~~
3.	10544-50-0	SULFUR, MOL. (S8)	14.14	8600	NJ UJ
4.		STRAIGHT-CHAIN ALKANE	19.43	200	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
40SB2C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-11RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 33 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	490	U
108-95-2	Phenol	490	U
111-44-4	Bis(2-chloroethyl)ether	490	U
95-57-8	2-Chlorophenol	490	U
95-48-7	2-Methylphenol	490	U
108-60-1	2,2'-oxybis(1-Chloropropane)	490	U
98-86-2	Acetophenone	490	U
106-44-5	4-Methylphenol	490	U
621-64-7	N-Nitroso-di-N-propylamine	490	U
67-72-1	Hexachloroethane	490	U
98-95-3	Nitrobenzene	490	U
78-59-1	Isophorone	490	U
88-75-5	2-Nitrophenol	490	U
105-67-9	2,4-Dimethylphenol	490	U
111-91-1	Bis(2-chloroethoxy)methane	490	U
120-83-2	2,4-Dichlorophenol	490	U
91-20-3	Naphthalene	490	U
106-47-8	4-Chloroaniline	490	U
87-68-3	Hexachlorobutadiene	490	U
105-60-2	Caprolactam	490	U
59-50-7	4-Chloro-3-methylphenol	490	U
91-57-6	2-Methylnaphthalene	78	J J,C
77-47-4	Hexachlorocyclopentadiene	490	U
88-06-2	2,4,6-Trichlorophenol	490	U
95-95-4	2,4,5-Trichlorophenol	490	U
92-52-4	1,1'-Biphenyl	490	U
91-58-7	2-Chloronaphthalene	490	U
88-74-4	2-Nitroaniline	990	U
131-11-3	Dimethylphthalate	490	U
606-20-2	2,6-Dinitrotoluene	490	U
208-96-8	Acenaphthylene	490	U
99-09-2	3-Nitroaniline	990	U
83-32-9	Acenaphthene	490	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-11RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 33 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2500	U
100-02-7	4-Nitrophenol	990	U
121-14-2	2,4-Dinitrotoluene	490	U
132-64-9	Dibenzofuran	490	U
84-66-2	Diethylphthalate	490	U
7005-72-3	4-Chlorophenyl-phenylether	490	U
86-73-7	Fluorene	490	U
100-01-6	4-Nitroaniline	990	U
534-52-1	4,6-Dinitro-2-methylphenol	990	U
86-30-6	N-Nitrosodiphenylamine (1)	490	U
101-55-3	4-Bromophenyl-phenylether	490	U
118-74-1	Hexachlorobenzene	490	U UJ/C
1912-24-9	Atrazine	490	U UJ/C
87-86-5	Pentachlorophenol	490	U
85-01-8	Phenanthrene	49	J
120-12-7	Anthracene	490	U
86-74-8	Carbazole	490	U
84-74-2	Di-n-butylphthalate	490	U
206-44-0	Fluoranthene	490	U
129-00-0	Pyrene	490	U
85-68-7	Butylbenzylphthalate	490	U
91-94-1	3,3'-Dichlorobenzidine	490	U
117-81-7	bis(2-ethylhexyl)Phthalate	78	J
56-55-3	Benzo(a)anthracene	490	U
218-01-9	Chrysene	490	U
117-84-0	Di-n-octylphthalate	490	U
205-99-2	Benzo(b)fluoranthene	490	U
207-08-9	Benzo(k)fluoranthene	490	U
50-32-8	Benzo(a)pyrene	490	U
193-39-5	Indeno(1,2,3-cd)pyrene	490	U
53-70-3	Dibenzo(a,h)anthracene	490	U
191-24-2	Benzo(g,h,i)perylene	490	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-11RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 33 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.64~~	~~1400~~	~~JB~~
2.		STRAIGHT-CHAIN ALKANE	7.81	380	J
3.		UNKNOWN ALKANE	8.95	290	J
4.		STRAIGHT-CHAIN ALKANE	9.09	960	J
5.		SUBSTITUTED BENZENE	9.16	290	J
6.	581-40-8	NAPHTHALENE, 2,3-DIMETHYL-	9.34	530	NJ
7.		STRAIGHT-CHAIN ALKANE	9.46	370	J
8.		STRAIGHT-CHAIN ALKANE	9.66	860	J
9.	829-26-5	NAPHTHALENE, 2,3,6-TRIMETHYL	9.95	670	NJ
10.	2131-42-2	NAPHTHALENE, 1,4,6-TRIMETHYL	10.09	270	NJ
11.		STRAIGHT-CHAIN ALKANE	10.22	660	J
12.		BRANCHED ALKANE	10.47	600	J
13.		STRAIGHT-CHAIN ALKANE	10.76	1300	J
14.		STRAIGHT-CHAIN ALKANE	11.37	650	J
15.		UNKNOWN	11.44	300	J
16.		STRAIGHT-CHAIN ALKANE	12.15	620	J
17.		STRAIGHT-CHAIN ALKANE	13.18	470	J
18.	7704-34-9	SULFUR	14.09	2000	NJ
19.		STRAIGHT-CHAIN ALKANE	14.31	340	J
20.		UNKNOWN	16.27	230	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-9RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 23 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	430	U
108-95-2	Phenol	430	U
111-44-4	Bis(2-chloroethyl)ether	430	U
95-57-8	2-Chlorophenol	430	U
95-48-7	2-Methylphenol	430	U
108-60-1	2,2'-oxybis(1-Chloropropane)	430	U
98-86-2	Acetophenone	430	U
106-44-5	4-Methylphenol	430	U
621-64-7	N-Nitroso-di-N-propylamine	430	U
67-72-1	Hexachloroethane	430	U
98-95-3	Nitrobenzene	430	U
78-59-1	Isophorone	430	U
88-75-5	2-Nitrophenol	430	U
105-67-9	2,4-Dimethylphenol	430	U
111-91-1	Bis(2-chloroethoxy)methane	430	U
120-83-2	2,4-Dichlorophenol	430	U
91-20-3	Naphthalene	44	J
106-47-8	4-Chloroaniline	430	U
87-68-3	Hexachlorobutadiene	430	U
105-60-2	Caprolactam	430	U
59-50-7	4-Chloro-3-methylphenol	430	U
91-57-6	2-Methylnaphthalene	430	U VJC
77-47-4	Hexachlorocyclopentadiene	430	U
88-06-2	2,4,6-Trichlorophenol	430	U
95-95-4	2,4,5-Trichlorophenol	430	U
92-52-4	1,1'-Biphenyl	35	J
91-58-7	2-Chloronaphthalene	430	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	430	U
606-20-2	2,6-Dinitrotoluene	430	U
208-96-8	Acenaphthylene	430	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	160	J

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-9RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 23 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	860	U
121-14-2	2,4-Dinitrotoluene	31	J
132-64-9	Dibenzofuran	44	J
84-66-2	Diethylphthalate	430	U
7005-72-3	4-Chlorophenyl-phenylether	430	U
86-73-7	Fluorene	170	J
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	60	J J,V
101-55-3	4-Bromophenyl-phenylether	430	U
118-74-1	Hexachlorobenzene	430	U UJ,C
1912-24-9	Atrazine	430	U UJ,V
87-86-5	Pentachlorophenol	430	U
85-01-8	Phenanthrene	180	J
120-12-7	Anthracene	69	J
86-74-8	Carbazole	430	U
84-74-2	Di-n-butylphthalate	350	J
206-44-0	Fluoranthene	320	J
129-00-0	Pyrene	230	J
85-68-7	Butylbenzylphthalate	430	U
91-94-1	3,3'-Dichlorobenzidine	430	U
117-81-7	bis(2-ethylhexyl)Phthalate	820	
56-55-3	Benzo(a)anthracene	83	J
218-01-9	Chrysene	88	J
117-84-0	Di-n-octylphthalate	430	U
205-99-2	Benzo(b)fluoranthene	430	U
207-08-9	Benzo(k)fluoranthene	59	J
50-32-8	Benzo(a)pyrene	48	J
193-39-5	Indeno(1,2,3-cd)pyrene	31	J
53-70-3	Dibenzo(a,h)anthracene	430	U
191-24-2	Benzo(g,h,i)perylene	32	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-9RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 23 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.64~~	~~1200~~	~~JB~~ C
2.	0-00-0	2-PROPENAL, 3-CHLORO-2,3-BIS	10.61	2100	NJ NJ,
3.		STRAIGHT-CHAIN ALKANE	10.76	190	J
4.	10544-50-0	SULFUR, MOL. (S8)	14.14	7500	NJ
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-4RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	UUJ,C
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-4RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U UJ,C
1912-24-9	Atrazine	400	U UJ,V
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	86	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	210	J
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
40SB4A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-4RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 14 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.43~~	~~190~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.71~~	~~1200~~	~~JB~~
3.	7704-34-9	SULFUR	14.21	340	NJ
4.		~~UNKNOWN (BC)~~	~~17.52~~	~~200~~	~~JB~~
5.		UNKNOWN	18.96	210	J
6.	28553-12-0	1,2-BENZENEDICARBOXYLIC ACID	19.08	200	NJ
7.		UNKNOWN PHTHALATE	19.38	370	J
8.		UNKNOWN PHTHALATE	19.52	640	J
9.		UNKNOWN PHTHALATE	19.62	350	J
10.		UNKNOWN PHTHALATE	19.70	430	J
11.		UNKNOWN PHTHALATE	19.76	390	J
12.		UNKNOWN PHTHALATE	19.84	390	J
13.		UNKNOWN PHTHALATE	19.89	240	J
14.		UNKNOWN	20.04	170	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-5RJ2A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 33 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
100-52-7	Benzaldehyde	490	U	
108-95-2	Phenol	320	J	
111-44-4	Bis(2-chloroethyl)ether	490	U	
95-57-8	2-Chlorophenol	490	U	
95-48-7	2-Methylphenol	490	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	490	U	
98-86-2	Acetophenone	490	U	
106-44-5	4-Methylphenol	73	J	
621-64-7	N-Nitroso-di-N-propylamine	490	U	
67-72-1	Hexachloroethane	490	U	
98-95-3	Nitrobenzene	490	U	
78-59-1	Isophorone	490	U	
88-75-5	2-Nitrophenol	490	U	
105-67-9	2,4-Dimethylphenol	490	U	
111-91-1	Bis(2-chloroethoxy)methane	490	U	
120-83-2	2,4-Dichlorophenol	490	U	
91-20-3	Naphthalene	110	J	
106-47-8	4-Chloroaniline	490	U	
87-68-3	Hexachlorobutadiene	490	U	
105-60-2	Caprolactam	490	U	
59-50-7	4-Chloro-3-methylphenol	490	U	
91-57-6	2-Methylnaphthalene	200	J	J,C
77-47-4	Hexachlorocyclopentadiene	490	U	
88-06-2	2,4,6-Trichlorophenol	490	U	
95-95-4	2,4,5-Trichlorophenol	490	U	
92-52-4	1,1'-Biphenyl	71	J	
91-58-7	2-Chloronaphthalene	490	U	
88-74-4	2-Nitroaniline	990	U	
131-11-3	Dimethylphthalate	490	U	
606-20-2	2,6-Dinitrotoluene	490	U	
208-96-8	Acenaphthylene	490	U	
99-09-2	3-Nitroaniline	990	U	
83-32-9	Acenaphthene	490	U	

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-5RJ2A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 33 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2500	U
100-02-7	4-Nitrophenol	990	U
121-14-2	2,4-Dinitrotoluene	490	U
132-64-9	Dibenzofuran	490	U
84-66-2	Diethylphthalate	100	J
7005-72-3	4-Chlorophenyl-phenylether	490	U
86-73-7	Fluorene	55	J
100-01-6	4-Nitroaniline	990	U
534-52-1	4,6-Dinitro-2-methylphenol	990	U
86-30-6	N-Nitrosodiphenylamine (1)	610	J,r
101-55-3	4-Bromophenyl-phenylether	490	U
118-74-1	Hexachlorobenzene	490	U UJ,c
1912-24-9	Atrazine	490	U UJ,r
87-86-5	Pentachlorophenol	490	U
85-01-8	Phenanthrene	170	J
120-12-7	Anthracene	490	U
86-74-8	Carbazole	490	U
84-74-2	Di-n-butylphthalate	650	
206-44-0	Fluoranthene	66	J
129-00-0	Pyrene	73	J
85-68-7	Butylbenzylphthalate	1100	
91-94-1	3,3'-Dichlorobenzidine	490	U
117-81-7	bis(2-ethylhexyl)Phthalate	2100	
56-55-3	Benzo(a)anthracene	490	U
218-01-9	Chrysene	56	J
117-84-0	Di-n-octylphthalate	290	J
205-99-2	Benzo(b)fluoranthene	490	U
207-08-9	Benzo(k)fluoranthene	490	U
50-32-8	Benzo(a)pyrene	490	U
193-39-5	Indeno(1,2,3-cd)pyrene	490	U
53-70-3	Dibenzo(a,h)anthracene	490	U
191-24-2	Benzo(g,h,i)perylene	490	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-5RJ2A64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 33 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	13.75	1100	J NJ
2.	7704-34-9	SULFUR	14.16	5300	NJ
3.		UNKNOWN	14.60	3500	J
4.	57-11-4	OCTADECANOIC ACID	15.07	3700	NJ
5.	80-05-7	PHENOL, 4,4'-(1-METHYLETHYLI	15.31	2300	NJ
6.		UNKNOWN PAH	15.75	5900	J
7.		STRAIGHT-CHAIN ALKANE	16.22	1700	J
8.		UNKNOWN PHTHALATE	16.44	4700	J
9.		STRAIGHT-CHAIN ALKANE	17.00	2900	J
10.		UNKNOWN	17.49	1600	J
11.		UNKNOWN PHTHALATE	17.96	1500	J
12.		STRAIGHT-CHAIN ALKANE	18.33	3400	J
13.		STRAIGHT-CHAIN ALKANE	18.69	1300	J
14.		STRAIGHT-CHAIN ALKANE	18.91	3100	J
15.		BRANCHED ALKANE	19.46	2400	J
16.		STRAIGHT-CHAIN ALKANE	20.48	1200	J
17.	544-76-3	HEXADECANE	20.83	1300	NJ
18.		UNKNOWN	21.00	2200	J
19.		UNKNOWN	21.41	1600	J
20.		UNKNOWN ALCOHOL	22.17	2600	J
21.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-1RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
40SB5A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-1RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U UJ,r
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	44	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB5A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-1RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.71~~	~~1200~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~17.52~~	~~170~~	~~JB~~ C
3.					
4.					
5.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-3RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-3RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	780	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U JJ1r
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	3100	
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
40SB5C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-3RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.71~~	~~1100~~	~~JB~~
2.		UNKNOWN	10.06	410	J
3.		UNKNOWN	10.70	300	J
4.		UNKNOWN	13.83	230	J
5.	10544-50-0	SULFUR, MOL. (S8)	14.25	4700	NJ
6.		UNKNOWN	14.66	740	J
7.		~~UNKNOWN (BC)~~	~~17.52~~	~~220~~	~~JB~~
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-2RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 42 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	570	U
108-95-2	Phenol	570	U
111-44-4	Bis(2-chloroethyl)ether	570	U
95-57-8	2-Chlorophenol	570	U
95-48-7	2-Methylphenol	570	U
108-60-1	2,2'-oxybis(1-Chloropropane)	570	U
98-86-2	Acetophenone	570	U
106-44-5	4-Methylphenol	570	U
621-64-7	N-Nitroso-di-N-propylamine	570	U
67-72-1	Hexachloroethane	570	U
98-95-3	Nitrobenzene	570	U
78-59-1	Isophorone	570	U
88-75-5	2-Nitrophenol	570	U
105-67-9	2,4-Dimethylphenol	570	U
111-91-1	Bis(2-chloroethoxy)methane	570	U
120-83-2	2,4-Dichlorophenol	570	U
91-20-3	Naphthalene	190	J
106-47-8	4-Chloroaniline	570	U
87-68-3	Hexachlorobutadiene	570	U
105-60-2	Caprolactam	570	U
59-50-7	4-Chloro-3-methylphenol	570	U
91-57-6	2-Methylnaphthalene	68	J
77-47-4	Hexachlorocyclopentadiene	570	U
88-06-2	2,4,6-Trichlorophenol	570	U
95-95-4	2,4,5-Trichlorophenol	570	U
92-52-4	1,1'-Biphenyl	570	U
91-58-7	2-Chloronaphthalene	570	U
88-74-4	2-Nitroaniline	1100	U
131-11-3	Dimethylphthalate	570	U
606-20-2	2,6-Dinitrotoluene	570	U
208-96-8	Acenaphthylene	570	U
99-09-2	3-Nitroaniline	1100	U
83-32-9	Acenaphthene	570	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-2RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 42 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2900	U
100-02-7	4-Nitrophenol	1100	U
121-14-2	2,4-Dinitrotoluene	570	U
132-64-9	Dibenzofuran	570	U
84-66-2	Diethylphthalate	180	J
7005-72-3	4-Chlorophenyl-phenylether	570	U
86-73-7	Fluorene	570	U
100-01-6	4-Nitroaniline	1100	U
534-52-1	4,6-Dinitro-2-methylphenol	1100	U
86-30-6	N-Nitrosodiphenylamine (1)	570	J,r
101-55-3	4-Bromophenyl-phenylether	570	U
118-74-1	Hexachlorobenzene	570	U
1912-24-9	Atrazine	570	U UJ,r
87-86-5	Pentachlorophenol	570	U
85-01-8	Phenanthrene	72	J
120-12-7	Anthracene	570	U
86-74-8	Carbazole	570	U
84-74-2	Di-n-butylphthalate	90	J
206-44-0	Fluoranthene	35	J
129-00-0	Pyrene	43	J
85-68-7	Butylbenzylphthalate	5900	
91-94-1	3,3'-Dichlorobenzidine	570	U
117-81-7	bis(2-ethylhexyl)Phthalate	2000	
56-55-3	Benzo(a)anthracene	570	U
218-01-9	Chrysene	570	U
117-84-0	Di-n-octylphthalate	570	U
205-99-2	Benzo(b)fluoranthene	570	U
207-08-9	Benzo(k)fluoranthene	570	U
50-32-8	Benzo(a)pyrene	570	U
193-39-5	Indeno(1,2,3-cd)pyrene	570	U
53-70-3	Dibenzo(a,h)anthracene	570	U
191-24-2	Benzo(g,h,i)perylene	570	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-2RB64

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: 42 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.71~~	~~1500~~	~~JB~~
2.		BRANCHED ALKANE	10.86	1500	J NJ
3.	10544-50-0	SULFUR, MOL. (S8)	14.29	13000	NJ
4.		UNKNOWN	14.68	2600	J
5.		UNKNOWN	14.97	1300	J
6.		UNKNOWN	15.73	1500	J
7.		STRAIGHT-CHAIN ALKANE	16.27	1100	J
8.		STRAIGHT-CHAIN ALKANE	17.05	2100	J
9.		UNKNOWN	17.22	1800	J
10.		UNKNOWN	17.54	1100	J
11.		STRAIGHT-CHAIN ALKANE	17.74	2800	J
12.		UNKNOWN PHTHALATE	18.01	2300	J
13.		STRAIGHT-CHAIN ALKANE	18.38	3500	J
14.		STRAIGHT-CHAIN ALKANE	18.98	4700	J
15.		BRANCHED ALKANE	19.52	4700	J
16.		BRANCHED ALKANE	20.04	5100	J
17.		STRAIGHT-CHAIN ALKANE	20.53	4500	J
18.		STRAIGHT-CHAIN ALKANE	21.01	3500	J
19.		STRAIGHT-CHAIN ALKANE	21.46	2500	J
20.		STRAIGHT-CHAIN ALKANE	21.89	1400	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-17RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 28 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	460	U
108-95-2	Phenol	460	U
111-44-4	Bis(2-chloroethyl)ether	460	U
95-57-8	2-Chlorophenol	460	U
95-48-7	2-Methylphenol	460	U
108-60-1	2,2'-oxybis(1-Chloropropane)	460	U
98-86-2	Acetophenone	460	U
106-44-5	4-Methylphenol	460	U
621-64-7	N-Nitroso-di-N-propylamine	460	U
67-72-1	Hexachloroethane	460	U
98-95-3	Nitrobenzene	460	U
78-59-1	Isophorone	460	U
88-75-5	2-Nitrophenol	460	U
105-67-9	2,4-Dimethylphenol	460	U
111-91-1	Bis(2-chloroethoxy)methane	460	U
120-83-2	2,4-Dichlorophenol	460	U
91-20-3	Naphthalene	460	U
106-47-8	4-Chloroaniline	460	U
87-68-3	Hexachlorobutadiene	460	U
105-60-2	Caprolactam	460	U
59-50-7	4-Chloro-3-methylphenol	460	U
91-57-6	2-Methylnaphthalene	460	UUJC
77-47-4	Hexachlorocyclopentadiene	460	U
88-06-2	2,4,6-Trichlorophenol	460	U
95-95-4	2,4,5-Trichlorophenol	460	U
92-52-4	1,1'-Biphenyl	460	U
91-58-7	2-Chloronaphthalene	460	U
88-74-4	2-Nitroaniline	920	U
131-11-3	Dimethylphthalate	460	U
606-20-2	2,6-Dinitrotoluene	460	U
208-96-8	Acenaphthylene	460	U
99-09-2	3-Nitroaniline	920	U
83-32-9	Acenaphthene	460	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-17RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 28 decanted: (Y/N) N Date Extracted: 11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2300	U
100-02-7	4-Nitrophenol	920	U
121-14-2	2,4-Dinitrotoluene	460	U
132-64-9	Dibenzofuran	460	U
84-66-2	Diethylphthalate	460	U
7005-72-3	4-Chlorophenyl-phenylether	460	U
86-73-7	Fluorene	460	U
100-01-6	4-Nitroaniline	920	U
534-52-1	4,6-Dinitro-2-methylphenol	920	U
86-30-6	N-Nitrosodiphenylamine (1)	460	U
101-55-3	4-Bromophenyl-phenylether	460	U
118-74-1	Hexachlorobenzene	460	U UJ/C
1912-24-9	Atrazine	460	U UJ/r
87-86-5	Pentachlorophenol	460	U
85-01-8	Phenanthrene	460	U
120-12-7	Anthracene	460	U
86-74-8	Carbazole	460	U
84-74-2	Di-n-butylphthalate	460	U
206-44-0	Fluoranthene	460	U
129-00-0	Pyrene	460	U
85-68-7	Butylbenzylphthalate	460	U
91-94-1	3,3'-Dichlorobenzidine	460	U
117-81-7	bis(2-ethylhexyl)Phthalate	55	J
56-55-3	Benzo(a)anthracene	460	U
218-01-9	Chrysene	460	U
117-84-0	Di-n-octylphthalate	460	U
205-99-2	Benzo(b)fluoranthene	460	U
207-08-9	Benzo(k)fluoranthene	460	U
50-32-8	Benzo(a)pyrene	460	U
193-39-5	Indeno(1,2,3-cd)pyrene	460	U
53-70-3	Dibenzo(a,h)anthracene	460	U
191-24-2	Benzo(g,h,i)perylene	460	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SB11B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-17RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 28 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.36~~	~~220~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.66~~	~~1600~~	~~JB~~
3.	112-70-9	1-TRIDECANOL	9.55	500	NJ NJ
4.		UNKNOWN	9.94	190	J
5.	693-67-4	UNDECANE, 1-BROMO-	10.04	550	NJ
6.	19047-85-9	PHOSPHONIC ACID, DIOCTADECYL	10.65	230	NJ
7.	7704-34-9	SULFUR	14.13	3000	NJ
8.	74663-86-8	CYCLOPROPANE, 1-ETHYL-2-HEPT	20.38	290	NJ
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-18RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	470	U
108-95-2	Phenol	470	U
111-44-4	Bis(2-chloroethyl)ether	470	U
95-57-8	2-Chlorophenol	470	U
95-48-7	2-Methylphenol	470	U
108-60-1	2,2'-oxybis(1-Chloropropane)	470	U
98-86-2	Acetophenone	470	U
106-44-5	4-Methylphenol	470	U
621-64-7	N-Nitroso-di-N-propylamine	470	U
67-72-1	Hexachloroethane	470	U
98-95-3	Nitrobenzene	470	U
78-59-1	Isophorone	470	U
88-75-5	2-Nitrophenol	470	U
105-67-9	2,4-Dimethylphenol	470	U
111-91-1	Bis(2-chloroethoxy)methane	470	U
120-83-2	2,4-Dichlorophenol	470	U
91-20-3	Naphthalene	470	U
106-47-8	4-Chloroaniline	470	U
87-68-3	Hexachlorobutadiene	470	U
105-60-2	Caprolactam	470	U
59-50-7	4-Chloro-3-methylphenol	470	U
91-57-6	2-Methylnaphthalene	470	UUJ,C
77-47-4	Hexachlorocyclopentadiene	470	U
88-06-2	2,4,6-Trichlorophenol	470	U
95-95-4	2,4,5-Trichlorophenol	470	U
92-52-4	1,1'-Biphenyl	470	U
91-58-7	2-Chloronaphthalene	470	U
88-74-4	2-Nitroaniline	940	U
131-11-3	Dimethylphthalate	470	U
606-20-2	2,6-Dinitrotoluene	470	U
208-96-8	Acenaphthylene	470	U
99-09-2	3-Nitroaniline	940	U
83-32-9	Acenaphthene	470	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-18RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2400	U
100-02-7	4-Nitrophenol	940	U
121-14-2	2,4-Dinitrotoluene	470	U
132-64-9	Dibenzofuran	470	U
84-66-2	Diethylphthalate	470	U
7005-72-3	4-Chlorophenyl-phenylether	470	U
86-73-7	Fluorene	470	U
100-01-6	4-Nitroaniline	940	U
534-52-1	4,6-Dinitro-2-methylphenol	940	U
86-30-6	N-Nitrosodiphenylamine (1)	470	U
101-55-3	4-Bromophenyl-phenylether	470	U
118-74-1	Hexachlorobenzene	470	U UJ,C
1912-24-9	Atrazine	470	U UJ,V
87-86-5	Pentachlorophenol	470	U
85-01-8	Phenanthrene	470	U
120-12-7	Anthracene	470	U
86-74-8	Carbazole	470	U
84-74-2	Di-n-butylphthalate	470	U
206-44-0	Fluoranthene	470	U
129-00-0	Pyrene	470	U
85-68-7	Butylbenzylphthalate	470	U
91-94-1	3,3'-Dichlorobenzidine	470	U
117-81-7	bis(2-ethylhexyl)Phthalate	50	J
56-55-3	Benzo(a)anthracene	470	U
218-01-9	Chrysene	470	U
117-84-0	Di-n-octylphthalate	470	U
205-99-2	Benzo(b)fluoranthene	470	U
207-08-9	Benzo(k)fluoranthene	470	U
50-32-8	Benzo(a)pyrene	470	U
193-39-5	Indeno(1,2,3-cd)pyrene	470	U
53-70-3	Dibenzo(a,h)anthracene	470	U
191-24-2	Benzo(g,h,i)perylene	470	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SB11C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-18RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.65	520	~~JB~~
2.		UNKNOWN	6.93	190	J NJ,
3.					
4.					
5.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-16RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U UJ, C
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	92	J
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-16RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	830	U
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U UJ,C
1912-24-9	Atrazine	410	U UJ,C
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	410	U
206-44-0	Fluoranthene	28	J
129-00-0	Pyrene	40	J
85-68-7	Butylbenzylphthalate	51	J
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	94	J
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	42	J
117-84-0	Di-n-octylphthalate	140	J
205-99-2	Benzo(b)fluoranthene	93	J
207-08-9	Benzo(k)fluoranthene	56	J
50-32-8	Benzo(a)pyrene	94	J
193-39-5	Indeno(1,2,3-cd)pyrene	99	J
53-70-3	Dibenzo(a,h)anthracene	34	J
191-24-2	Benzo(g,h,i)perylene	96	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-16RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.36~~	~~190~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.66~~	~~1400~~	~~JB~~
3.		UNKNOWN	7.33	170	J NJ
4.	638-53-9	TRIDECANOIC ACID	12.77	190	NJ
5.	7704-34-9	SULFUR	14.18	9900	NJ
6.		STRAIGHT-CHAIN ALKANE	18.89	330	J
7.		UNKNOWN PHTHALATE	19.70	550	J
8.		UNKNOWN	20.24	280	J
9.		UNKNOWN	20.61	720	J
10.		UNKNOWN	21.39	690	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-15RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 6 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	350	U
108-95-2	Phenol	350	U
111-44-4	Bis(2-chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
98-86-2	Acetophenone	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-N-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	Bis(2-chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
91-20-3	Naphthalene	25	J
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
105-60-2	Caprolactam	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	78	J JC
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	350	U
92-52-4	1,1'-Biphenyl	350	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	700	U
131-11-3	Dimethylphthalate	350	U
606-20-2	2,6-Dinitrotoluene	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	700	U
83-32-9	Acenaphthene	350	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-15RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 6 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1800	U
100-02-7	4-Nitrophenol	700	U
121-14-2	2,4-Dinitrotoluene	350	U
132-64-9	Dibenzofuran	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	700	U
534-52-1	4,6-Dinitro-2-methylphenol	700	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U UJ,C
1912-24-9	Atrazine	350	U UJ,R
87-86-5	Pentachlorophenol	350	U
85-01-8	Phenanthrene	41	J
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
117-81-7	bis(2-ethylhexyl)Phthalate	47	J
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-84-0	Di-n-octylphthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenzo(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-15RA64

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: 6 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.66~~	~~1000~~	~~JB~~
2.		UNKNOWN	9.93	180	J
3.		STRAIGHT-CHAIN ALKANE	10.76	210	J
4.	10544-50-0	SULFUR, MOL. (S8)	14.10	980	NJ
5.		UNKNOWN	21.82	180	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-14RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 27 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	450	U
108-95-2	Phenol	450	U
111-44-4	Bis(2-chloroethyl)ether	450	U
95-57-8	2-Chlorophenol	450	U
95-48-7	2-Methylphenol	450	U
108-60-1	2,2'-oxybis(1-Chloropropane)	450	U
98-86-2	Acetophenone	450	U
106-44-5	4-Methylphenol	98	J
621-64-7	N-Nitroso-di-N-propylamine	450	U
67-72-1	Hexachloroethane	450	U
98-95-3	Nitrobenzene	450	U
78-59-1	Isophorone	450	U
88-75-5	2-Nitrophenol	450	U
105-67-9	2,4-Dimethylphenol	450	U
111-91-1	Bis(2-chloroethoxy)methane	450	U
120-83-2	2,4-Dichlorophenol	450	U
91-20-3	Naphthalene	450	U
106-47-8	4-Chloroaniline	450	U
87-68-3	Hexachlorobutadiene	450	U
105-60-2	Caprolactam	450	U
59-50-7	4-Chloro-3-methylphenol	450	U
91-57-6	2-Methylnaphthalene	120	JJ/C
77-47-4	Hexachlorocyclopentadiene	450	U
88-06-2	2,4,6-Trichlorophenol	450	U
95-95-4	2,4,5-Trichlorophenol	450	U
92-52-4	1,1'-Biphenyl	450	U
91-58-7	2-Chloronaphthalene	450	U
88-74-4	2-Nitroaniline	900	U
131-11-3	Dimethylphthalate	450	U
606-20-2	2,6-Dinitrotoluene	450	U
208-96-8	Acenaphthylene	450	U
99-09-2	3-Nitroaniline	900	U
83-32-9	Acenaphthene	450	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-14RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 27 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2300	U
100-02-7	4-Nitrophenol	900	U
121-14-2	2,4-Dinitrotoluene	450	U
132-64-9	Dibenzofuran	450	U
84-66-2	Diethylphthalate	450	U
7005-72-3	4-Chlorophenyl-phenylether	450	U
86-73-7	Fluorene	450	U
100-01-6	4-Nitroaniline	900	U
534-52-1	4,6-Dinitro-2-methylphenol	900	U
86-30-6	N-Nitrosodiphenylamine (1)	390	J
101-55-3	4-Bromophenyl-phenylether	450	U
118-74-1	Hexachlorobenzene	450	U UJ,C
1912-24-9	Atrazine	450	U UJ,Y
87-86-5	Pentachlorophenol	450	U
85-01-8	Phenanthrene	42	J
120-12-7	Anthracene	450	U
86-74-8	Carbazole	450	U
84-74-2	Di-n-butylphthalate	50	J
206-44-0	Fluoranthene	450	U
129-00-0	Pyrene	450	U
85-68-7	Butylbenzylphthalate	450	U
91-94-1	3,3'-Dichlorobenzidine	450	U
117-81-7	bis(2-ethylhexyl)Phthalate	1000	
56-55-3	Benzo(a)anthracene	450	U
218-01-9	Chrysene	450	U
117-84-0	Di-n-octylphthalate	450	U
205-99-2	Benzo(b)fluoranthene	450	U
207-08-9	Benzo(k)fluoranthene	450	U
50-32-8	Benzo(a)pyrene	450	U
193-39-5	Indeno(1,2,3-cd)pyrene	450	U
53-70-3	Dibenzo(a,h)anthracene	450	U
191-24-2	Benzo(g,h,i)perylene	450	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
D-5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-14RA64

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: 27 decanted: (Y/N) N Date Extracted:11/25/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/09/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.66~~	~~1300~~	~~JB~~ C
2.		BRANCHED ALKANE	7.25	610	J NJ
3.		BRANCHED ALKANE	7.59	830	J
4.	10544-50-0	SULFUR, MOL. (S8)	14.14	5600	NJ
5.		UNKNOWN	14.58	2600	J
6.	90-30-2	1-NAPHTHALENAMINE, N-PHENYL-	15.02	1700	NJ
7.		STRAIGHT-CHAIN ALKANE	15.32	620	J
8.	135-88-6	2-NAPHTHALENAMINE, N-PHENYL-	15.83	930	NJ
9.		BRANCHED ALKANE	16.19	1200	J
10.		STRAIGHT-CHAIN ALKANE	16.96	2200	J
11.		UNKNOWN	17.15	1200	J
12.		STRAIGHT-CHAIN ALKANE	17.67	2700	J
13.		UNKNOWN PHTHALATE	17.96	12000	J
14.		STRAIGHT-CHAIN ALKANE	18.31	2800	J
15.		STRAIGHT-CHAIN ALKANE	18.91	2000	J
16.		STRAIGHT-CHAIN ALKANE	19.45	1400	J
17.		STRAIGHT-CHAIN ALKANE	19.97	1000	J
18.		STRAIGHT-CHAIN ALKANE	20.46	1100	J
19.		STRAIGHT-CHAIN ALKANE	20.93	620	J
20.		UNKNOWN	21.39	1300	J
21.					
22.					
23.					
24.					
25.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT2BP

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-20B64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 25 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/29/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	440	U
108-95-2	Phenol	440	U
111-44-4	Bis(2-chloroethyl)ether	440	U
95-57-8	2-Chlorophenol	440	U
95-48-7	2-Methylphenol	440	U
108-60-1	2,2'-oxybis(1-Chloropropane)	440	U
98-86-2	Acetophenone	440	U
106-44-5	4-Methylphenol	440	U
621-64-7	N-Nitroso-di-N-propylamine	440	U
67-72-1	Hexachloroethane	440	U
98-95-3	Nitrobenzene	440	U
78-59-1	Isophorone	440	U
88-75-5	2-Nitrophenol	440	U
105-67-9	2,4-Dimethylphenol	440	U
111-91-1	Bis(2-chloroethoxy)methane	440	U
120-83-2	2,4-Dichlorophenol	440	U
91-20-3	Naphthalene	440	U
106-47-8	4-Chloroaniline	440	U
87-68-3	Hexachlorobutadiene	440	U
105-60-2	Caprolactam	440	U
59-50-7	4-Chloro-3-methylphenol	440	U
91-57-6	2-Methylnaphthalene	440	U
77-47-4	Hexachlorocyclopentadiene	440	U
88-06-2	2,4,6-Trichlorophenol	440	U
95-95-4	2,4,5-Trichlorophenol	440	U
92-52-4	1,1'-Biphenyl	440	U
91-58-7	2-Chloronaphthalene	440	U
88-74-4	2-Nitroaniline	880	U
131-11-3	Dimethylphthalate	440	U
606-20-2	2,6-Dinitrotoluene	440	U
208-96-8	Acenaphthylene	440	U
99-09-2	3-Nitroaniline	880	U
83-32-9	Acenaphthene	440	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT2BP

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-20B64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 25 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/29/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	880	U
121-14-2	2,4-Dinitrotoluene	440	U
132-64-9	Dibenzofuran	440	U
84-66-2	Diethylphthalate	440	U
7005-72-3	4-Chlorophenyl-phenylether	440	U
86-73-7	Fluorene	440	U
100-01-6	4-Nitroaniline	880	U
534-52-1	4,6-Dinitro-2-methylphenol	880	U
86-30-6	N-Nitrosodiphenylamine (1)	440	U
101-55-3	4-Bromophenyl-phenylether	440	U
118-74-1	Hexachlorobenzene	440	U
1912-24-9	Atrazine	440	U
87-86-5	Pentachlorophenol	440	U
85-01-8	Phenanthrene	440	U
120-12-7	Anthracene	440	U
86-74-8	Carbazole	440	U
84-74-2	Di-n-butylphthalate	440	U
206-44-0	Fluoranthene	440	U
129-00-0	Pyrene	440	U
85-68-7	Butylbenzylphthalate	440	U
91-94-1	3,3'-Dichlorobenzidine	440	U
117-81-7	bis(2-ethylhexyl)Phthalate	440	U
56-55-3	Benzo(a)anthracene	440	U
218-01-9	Chrysene	440	U
117-84-0	Di-n-octylphthalate	440	U
205-99-2	Benzo(b)fluoranthene	440	U
207-08-9	Benzo(k)fluoranthene	440	U
50-32-8	Benzo(a)pyrene	440	U
193-39-5	Indeno(1,2,3-cd)pyrene	440	U
53-70-3	Dibenzo(a,h)anthracene	440	U
191-24-2	Benzo(g,h,i)perylene	440	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT2BP

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-20B64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 25 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/29/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.71~~	~~1400~~	~~JB~~
2.	10544-50-0	SULFUR, MOL. (S8)	14.21	970	NJ NJ
3.		UNKNOWN	17.51	180	J
4.					
5.					
6.					
7.					
8.					
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10.					
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12.					
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30.					

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-19JB64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	97	J
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	100	J
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	390	J
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	75	J
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-19JB64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 20 decanted: (Y/N) N Date Extracted: 11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	830	U
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	110	J
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
86-30-6	N-Nitrosodiphenylamine (1)	3500	J1r
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	UJ1r
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	200	J
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	62	J
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	34	J
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	1100	
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	39	J
117-84-0	Di-n-octylphthalate	170	J
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2788-19JB64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	938-24-9	1H-INDENE-1,2,3-TRIONE	8.76	720	NJ
2.	581-42-0	NAPHTHALENE, 2,6-DIMETHYL-	9.30	860	NJ
3.	581-42-0	NAPHTHALENE, 2,6-DIMETHYL-	9.42	1600	NJ
4.	575-41-7	NAPHTHALENE, 1,3-DIMETHYL-	9.52	1300	NJ
5.		STRAIGHT-CHAIN ALKANE	9.72	910	J
6.	829-26-5	NAPHTHALENE, 2,3,6-TRIMETHYL	10.01	1600	NJ
7.		SUBSTITUTED NAPHTHALENE	10.82	830	J
8.		BRANCHED ALKANE	10.85	960	J
9.		BRANCHED ALKANE	11.53	780	J
10.	7704-34-9	SULFUR	14.25	3400	NJ
11.		UNKNOWN	14.68	730	J
12.		STRAIGHT-CHAIN ALKANE	17.05	1500	J
13.		STRAIGHT-CHAIN ALKANE	18.38	1400	J
14.		STRAIGHT-CHAIN ALKANE	18.96	1300	J
15.		STRAIGHT-CHAIN ALKANE	19.52	1200	J
16.		STRAIGHT-CHAIN ALKANE	20.04	1000	J
17.		STRAIGHT-CHAIN ALKANE	20.53	820	J
18.		UNKNOWN	21.46	860	J
19.		UNKNOWN	22.27	1500	J
20.		UNKNOWN	23.59	1200	J
21.					
22.					
23.					
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FORM I SV-TIC

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	1200	P J,g
86-73-7	Fluorene	51	U
129-00-0	Pyrene	87	JP J,g
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	170	P J,g
218-01-9	Chrysene	680	P
205-99-2	Benzo(b)fluoranthene	32	JP ↓
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	14	J
50-32-8	Benzo(a)pyrene	35	J
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 28 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/02/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	58	U
83-32-9	Acenaphthene	58	U
86-73-7	Fluorene	58	U
129-00-0	Pyrene	23	J
85-01-8	Phenanthrene	58	U
120-12-7	Anthracene	58	U
206-44-0	Fluoranthene	7.6	J
218-01-9	Chrysene	12	U
205-99-2	Benzo(b)fluoranthene	12	U
207-08-9	Benzo(k)fluoranthene	12	U
53-70-3	Dibenzo(a,h)anthracene	12	U
191-24-2	Benzo(g,h,i)perylene	12	U
56-55-3	Benzo(a)anthracene	12	U
50-32-8	Benzo(a)pyrene	12	U
193-39-5	Indeno(1,2,3-cd)pyrene	12	U
208-96-8	Acenaphthylene	58	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 45 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	76	U
83-32-9	Acenaphthene	640	
86-73-7	Fluorene	76	U
129-00-0	Pyrene	370	JPZ J, g
85-01-8	Phenanthrene	76	U
120-12-7	Anthracene	76	U
206-44-0	Fluoranthene	450	P J, g
218-01-9	Chrysene	3700	PZ ↓
205-99-2	Benzo(b)fluoranthene	98	JPZ
207-08-9	Benzo(k)fluoranthene	15	U
53-70-3	Dibenzo(a,h)anthracene	15	U
191-24-2	Benzo(g,h,i)perylene	15	U
56-55-3	Benzo(a)anthracene	820	PZ J, g
50-32-8	Benzo(a)pyrene	15	U
193-39-5	Indeno(1,2,3-cd)pyrene	15	U
208-96-8	Acenaphthylene	320	JPZ J, g

Z (Results reported with a twenty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 11/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	20	JP J,g
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	JP J,g
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 24 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	55	U
83-32-9	Acenaphthene	55	U
86-73-7	Fluorene	55	U
129-00-0	Pyrene	22	U
85-01-8	Phenanthrene	55	U
120-12-7	Anthracene	55	U
206-44-0	Fluoranthene	22	U
218-01-9	Chrysene	2100	PZ J,J
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	55	U

Z (Resukts reported with a twenty fold dilution)

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 33 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	63	U
83-32-9	Acenaphthene	63	U
86-73-7	Fluorene	63	U
129-00-0	Pyrene	310	JPZ J, g
85-01-8	Phenanthrene	63	U
120-12-7	Anthracene	63	U
206-44-0	Fluoranthene	25	U
218-01-9	Chrysene	2000	PZ J, g
205-99-2	Benzo(b)fluoranthene	12	U
207-08-9	Benzo(k)fluoranthene	12	U
53-70-3	Dibenzo(a,h)anthracene	12	U
191-24-2	Benzo(g,h,i)perylene	12	U
56-55-3	Benzo(a)anthracene	12	U
50-32-8	Benzo(a)pyrene	12	U
193-39-5	Indeno(1,2,3-cd)pyrene	12	U
208-96-8	Acenaphthylene	63	U

Z (Results reported with a twenty fold dilution)

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 23 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	54	U
83-32-9	Acenaphthene	54	U
86-73-7	Fluorene	54	U
129-00-0	Pyrene	300	JPZ J, g
85-01-8	Phenanthrene	54	U
120-12-7	Anthracene	54	U
206-44-0	Fluoranthene	150	P J, g
218-01-9	Chrysene	1900	PZ
205-99-2	Benzo(b)fluoranthene	56	JPZ
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	54	U

Z(Results reported with a twenty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	67	JPZ J, g
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.8	U
205-99-2	Benzo(b)fluoranthene	19	JPZ J, g
207-08-9	Benzo(k)fluoranthene	9.8	U
53-70-3	Dibenzo(a,h)anthracene	9.8	U
191-24-2	Benzo(g,h,i)perylene	9.8	U
56-55-3	Benzo(a)anthracene	9.8	U
50-32-8	Benzo(a)pyrene	9.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.8	U
208-96-8	Acenaphthylene	49	U

Z (Results reported with a five fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 33 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	63	U
83-32-9	Acenaphthene	63	U
86-73-7	Fluorene	63	U
129-00-0	Pyrene	280	JPZJ,J
85-01-8	Phenanthrene	63	U
120-12-7	Anthracene	63	U
206-44-0	Fluoranthene	760	EP J,J
218-01-9	Chrysene	2300	PZ
205-99-2	Benzo(b)fluoranthene	78	JPZ
207-08-9	Benzo(k)fluoranthene	42	JPZ
53-70-3	Dibenzo(a,h)anthracene	12	U
191-24-2	Benzo(g,h,i)perylene	12	U
56-55-3	Benzo(a)anthracene	12	U
50-32-8	Benzo(a)pyrene	12	U
193-39-5	Indeno(1,2,3-cd)pyrene	12	U
208-96-8	Acenaphthylene	63	U

Z (Results reported with a twenty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB5A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	4.5	J
205-99-2	Benzo(b)fluoranthene	4.2	J
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	3.8	J
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB5C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	1300	PZ J, g
86-73-7	Fluorene	49	U
129-00-0	Pyrene	120	JPZ J, g
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	1500	PZ J, g
205-99-2	Benzo(b)fluoranthene	9.8	U
207-08-9	Benzo(k)fluoranthene	24	JPZ J, g
53-70-3	Dibenzo(a,h)anthracene	9.8	U
191-24-2	Benzo(g,h,i)perylene	9.8	U
56-55-3	Benzo(a)anthracene	9.8	U
50-32-8	Benzo(a)pyrene	9.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.8	U
208-96-8	Acenaphthylene	74	JPZ J, g

Z (Results reported with a ten fold dilution)

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 42 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	72	U
83-32-9	Acenaphthene	72	U
86-73-7	Fluorene	72	U
129-00-0	Pyrene	940	PZ J,g
85-01-8	Phenanthrene	72	U
120-12-7	Anthracene	72	U
206-44-0	Fluoranthene	550	P J,g
218-01-9	Chrysene	2300	PZ
205-99-2	Benzo(b)fluoranthene	160	JPZ
207-08-9	Benzo(k)fluoranthene	14	U
53-70-3	Dibenzo(a,h)anthracene	14	U
191-24-2	Benzo(g,h,i)perylene	14	U
56-55-3	Benzo(a)anthracene	14	U
50-32-8	Benzo(a)pyrene	14	U
193-39-5	Indeno(1,2,3-cd)pyrene	14	U
208-96-8	Acenaphthylene	660	JPZ J,g

Z (Results reported with a twenty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/20/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	52	U
83-32-9	Acenaphthene	52	U
86-73-7	Fluorene	52	U
129-00-0	Pyrene	290	JPZ J, J
85-01-8	Phenanthrene	52	U
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	300	P J, J
218-01-9	Chrysene	3200	PZ ↓
205-99-2	Benzo(b)fluoranthene	56	JPZ
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	210	PZ J, J
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	120	JPZ J, J
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	360	JPZ J, J

Z (Results reported with a twenty fold dilution)

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 6 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/20/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/02/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	120	P J/B
83-32-9	Acenaphthene	140	P
86-73-7	Fluorene	45	U
129-00-0	Pyrene	18	U
85-01-8	Phenanthrene	67	
120-12-7	Anthracene	45	U
206-44-0	Fluoranthene	82	
218-01-9	Chrysene	54	P J/C
205-99-2	Benzo(b)fluoranthene	15	
207-08-9	Benzo(k)fluoranthene	17	P
53-70-3	Dibenzo(a,h)anthracene	8.8	U
191-24-2	Benzo(g,h,i)perylene	8.8	U
56-55-3	Benzo(a)anthracene	36	P J/B
50-32-8	Benzo(a)pyrene	20	
193-39-5	Indeno(1,2,3-cd)pyrene	8.8	U
208-96-8	Acenaphthylene	120	P D/A

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-5

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 27 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	1600	PZ J
83-32-9	Acenaphthene	3400	PZ J
86-73-7	Fluorene	58	U
129-00-0	Pyrene	350	JZ J
85-01-8	Phenanthrene	58	U
120-12-7	Anthracene	58	U
206-44-0	Fluoranthene	320	
218-01-9	Chrysene	3000	PZ J
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	200	JZ
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	3700	PZ J
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	2000	PZ J

Z (Results reported with a twenty fold dilution)

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/25/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	52	U UJ,M
83-32-9	Acenaphthene	52	U
86-73-7	Fluorene	52	U
129-00-0	Pyrene	450	PZ J/8
85-01-8	Phenanthrene	330	
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	1600	EP J/8
218-01-9	Chrysene	2400	PZ
205-99-2	Benzo(b)fluoranthene	150	JPZ
207-08-9	Benzo(k)fluoranthene	42	JPZ
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	220	PZ J/8
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	820	JPZ J/8

Z (Results reported with a twenty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKVV

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21474-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	42	U
83-32-9	Acenaphthene	42	U
86-73-7	Fluorene	42	U
129-00-0	Pyrene	17	U
85-01-8	Phenanthrene	42	U
120-12-7	Anthracene	42	U
206-44-0	Fluoranthene	17	U
218-01-9	Chrysene	8.3	U
205-99-2	Benzo(b)fluoranthene	8.3	U
207-08-9	Benzo(k)fluoranthene	8.3	U
53-70-3	Dibenzo(a,h)anthracene	8.3	U
191-24-2	Benzo(g,h,i)perylene	8.3	U
56-55-3	Benzo(a)anthracene	8.3	U
50-32-8	Benzo(a)pyrene	8.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	8.3	U
208-96-8	Acenaphthylene	42	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKXZ

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21642-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/08/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	42	U
83-32-9	Acenaphthene	42	U
86-73-7	Fluorene	42	U
129-00-0	Pyrene	17	U
85-01-8	Phenanthrene	42	U
120-12-7	Anthracene	42	U
206-44-0	Fluoranthene	17	U
218-01-9	Chrysene	8.3	U
205-99-2	Benzo(b)fluoranthene	8.3	U
207-08-9	Benzo(k)fluoranthene	8.3	U
53-70-3	Dibenzo(a,h)anthracene	8.3	U
191-24-2	Benzo(g,h,i)perylene	8.3	U
56-55-3	Benzo(a)anthracene	8.3	U
50-32-8	Benzo(a)pyrene	8.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	8.3	U
208-96-8	Acenaphthylene	42	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.1	U
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.1	U
50-29-3	4,4'-DDT	6.1	U UJ,C
60-57-1	Dieldrin	2.1	U
959-98-8	Endosulfan I	2.1	U
33213-65-9	Endosulfan II	4.0	U
1031-07-8	Endosulfan sulfate	4.0	U
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	1.0	U
72-43-5	Methoxychlor	10	U UJ,C
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	79	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	79	U
53469-21-9	Aroclor-1242	55	U
12672-29-6	Aroclor-1248	55	U
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	130	
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.1	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2A

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.1	U
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.1	U
50-29-3	4,4'-DDT	6.1	U UJ,C
60-57-1	Dieldrin	2.1	U
959-98-8	Endosulfan I	2.1	U
33213-65-9	Endosulfan II	4.0	U
1031-07-8	Endosulfan sulfate	4.0	U
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	1.0	U
72-43-5	Methoxychlor	10	U UJ,C
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	79	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	79	U
53469-21-9	Aroclor-1242	55	U
12672-29-6	Aroclor-1248	55	U
11097-69-1	Aroclor-1254	22	J
11096-82-5	Aroclor-1260	79	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.1	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.98	U
319-84-6	alpha-BHC	0.98	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	0.98	U
58-89-9	gamma-BHC (Lindane)	0.98	U
72-54-8	4,4'-DDD	3.9	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	5.9	U UJ,C
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
72-20-8	Endrin	3.9	U
7421-93-4	Endrin Aldehyde	3.9	U
76-44-8	Heptachlor	0.98	U
1024-57-3	Heptachlor Epoxide	0.98	U
72-43-5	Methoxychlor	9.8	U UJ,C
8001-35-2	Toxaphene	98	U
12674-11-2	Aroclor-1016	76	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	76	U
53469-21-9	Aroclor-1242	53	U
12672-29-6	Aroclor-1248	53	U
11097-69-1	Aroclor-1254	53	U
11096-82-5	Aroclor-1260	76	U
53494-70-5	Endrin Ketone	9.8	U
5103-74-2	gamma-Chlordane	0.98	U
5103-71-9	alpha-Chlordane	2.0	U

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

40SB5A

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	6.0	U UJ,C
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	4.0	U
1031-07-8	Endosulfan sulfate	4.0	U
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	1.0	U
72-43-5	Methoxychlor	10	U UJ,C
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	78	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	78	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Aroclor-1254	75	
11096-82-5	Aroclor-1260	21	J
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 6 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
309-00-2	Aldrin	0.88	U	
319-84-6	alpha-BHC	0.88	U	
319-85-7	beta-BHC	1.8	U	
319-86-8	delta-BHC	0.88	U	
58-89-9	gamma-BHC (Lindane)	0.88	U	
72-54-8	4,4'-DDD	3.5	U	
72-55-9	4,4'-DDE	1.8	U	
50-29-3	4,4'-DDT	5.3	U	UJ,C
60-57-1	Dieldrin	1.8	U	
959-98-8	Endosulfan I	1.8	U	
33213-65-9	Endosulfan II	3.5	U	
1031-07-8	Endosulfan sulfate	3.5	U	
72-20-8	Endrin	3.5	U	
7421-93-4	Endrin Aldehyde	3.5	U	
76-44-8	Heptachlor	0.88	U	
1024-57-3	Heptachlor Epoxide	0.88	U	
72-43-5	Methoxychlor	8.8	U	UJ,C
8001-35-2	Toxaphene	88	U	
12674-11-2	Aroclor-1016	69	U	
11104-28-2	Aroclor-1221	90	U	
11141-16-5	Aroclor-1232	69	U	
53469-21-9	Aroclor-1242	48	U	
12672-29-6	Aroclor-1248	48	U	
11097-69-1	Aroclor-1254	83	P	J,P
11096-82-5	Aroclor-1260	35	J	
53494-70-5	Endrin Ketone	8.8	U	
5103-74-2	gamma-Chlordane	0.88	U	
5103-71-9	alpha-Chlordane	1.8	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT2BP

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 25 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
309-00-2	Aldrin	1.1	U	
319-84-6	alpha-BHC	1.1	U	
319-85-7	beta-BHC	2.3	U	
319-86-8	delta-BHC	1.1	U	
58-89-9	gamma-BHC (Lindane)	1.1	U	
72-54-8	4,4'-DDD	4.4	U	
72-55-9	4,4'-DDE	2.3	U	
50-29-3	4,4'-DDT	6.7	U	UJ, c
60-57-1	Dieldrin	2.3	U	
959-98-8	Endosulfan I	2.3	U	
33213-65-9	Endosulfan II	4.4	U	
1031-07-8	Endosulfan sulfate	4.4	U	
72-20-8	Endrin	4.4	U	
7421-93-4	Endrin Aldehyde	4.4	U	
76-44-8	Heptachlor	1.1	U	
1024-57-3	Heptachlor Epoxide	1.1	U	
72-43-5	Methoxychlor	11	U	UJ, c
8001-35-2	Toxaphene	110	U	
12674-11-2	Aroclor-1016	87	U	
11104-28-2	Aroclor-1221	110	U	
11141-16-5	Aroclor-1232	87	U	
53469-21-9	Aroclor-1242	60	U	
12672-29-6	Aroclor-1248	60	U	
11097-69-1	Aroclor-1254	34	J	
11096-82-5	Aroclor-1260	87	U	
53494-70-5	Endrin Ketone	11	U	
5103-74-2	gamma-Chlordane	1.1	U	
5103-71-9	alpha-Chlordane	2.3	U	

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

TESTPIT2F

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/26/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U UJ,M
319-85-7	beta-BHC	2.1	U
319-86-8	delta-BHC	1.0	U UJ,M
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.1	U
72-55-9	4,4'-DDE	2.1	U
50-29-3	4,4'-DDT	6.3	U UJ,C
60-57-1	Dieldrin	2.1	U
959-98-8	Endosulfan I	2.1	U
33213-65-9	Endosulfan II	4.1	U
1031-07-8	Endosulfan sulfate	4.1	U UJ,M
72-20-8	Endrin	4.1	U
7421-93-4	Endrin Aldehyde	4.1	U UJ,M
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	1.0	U
72-43-5	Methoxychlor	10	U UJ,C
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	160	
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	81	U
53469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	210	
11096-82-5	Aroclor-1260	66	J
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.1	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1B

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 28 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	45	U
11104-28-2	Aroclor-1221	59	U
11141-16-5	Aroclor-1232	45	U
53469-21-9	Aroclor-1242	31	U
12672-29-6	Aroclor-1248	31	U
11097-69-1	Aroclor-1254	31	U
11096-82-5	Aroclor-1260	45	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 30 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	46	U
11104-28-2	Aroclor-1221	61	U
11141-16-5	Aroclor-1232	46	U
53469-21-9	Aroclor-1242	32	U
12672-29-6	Aroclor-1248	32	U
11097-69-1	Aroclor-1254	32	U
11096-82-5	Aroclor-1260	46	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 45 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	250	JP J,g
11104-28-2	Aroclor-1221	390	U
11141-16-5	Aroclor-1232	300	U
53469-21-9	Aroclor-1242	200	U
12672-29-6	Aroclor-1248	200	U
11097-69-1	Aroclor-1254	1400	P J,g
11096-82-5	Aroclor-1260	500	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 24 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	43	U
11104-28-2	Aroclor-1221	56	U
11141-16-5	Aroclor-1232	30	J
53469-21-9	Aroclor-1242	30	U
12672-29-6	Aroclor-1248	30	U
11097-69-1	Aroclor-1254	30	U
11096-82-5	Aroclor-1260	43	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 33 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	63	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	49	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 23 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	42	U
11104-28-2	Aroclor-1221	55	U
11141-16-5	Aroclor-1232	42	U
53469-21-9	Aroclor-1242	29	U
12672-29-6	Aroclor-1248	29	U
11097-69-1	Aroclor-1254	150	P J,g
11096-82-5	Aroclor-1260	42	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	38	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	38	U
53469-21-9	Aroclor-1242	26	U
12672-29-6	Aroclor-1248	26	U
11097-69-1	Aroclor-1254	26	U
11096-82-5	Aroclor-1260	38	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 33 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	970	U
11104-28-2	Aroclor-1221	1300	U
11141-16-5	Aroclor-1232	970	U
53469-21-9	Aroclor-1242	670	U
12672-29-6	Aroclor-1248	670	U
11097-69-1	Aroclor-1254	2600	P J,8
11096-82-5	Aroclor-1260	350	J

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

40SB5C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	38	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	38	U
53469-21-9	Aroclor-1242	26	U
12672-29-6	Aroclor-1248	26	U
11097-69-1	Aroclor-1254	26	U
11096-82-5	Aroclor-1260	38	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 42 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/13/02

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	210	
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	110	U
53469-21-9	Aroclor-1242	78	U
12672-29-6	Aroclor-1248	78	U
11097-69-1	Aroclor-1254	500	
11096-82-5	Aroclor-1260	160	J,C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11B

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 28 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/22/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	45	U
11104-28-2	Aroclor-1221	59	U
11141-16-5	Aroclor-1232	45	U
53469-21-9	Aroclor-1242	31	U
12672-29-6	Aroclor-1248	31	U
11097-69-1	Aroclor-1254	31	U
11096-82-5	Aroclor-1260	45	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 30 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/22/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	46	U
11104-28-2	Aroclor-1221	61	U
11141-16-5	Aroclor-1232	46	U
53469-21-9	Aroclor-1242	32	U
12672-29-6	Aroclor-1248	32	U
11097-69-1	Aroclor-1254	32	U
11096-82-5	Aroclor-1260	46	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/22/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	68	
11104-28-2	Aroclor-1221	53	U
11141-16-5	Aroclor-1232	41	U
53469-21-9	Aroclor-1242	28	U
12672-29-6	Aroclor-1248	28	U
11097-69-1	Aroclor-1254	320	
11096-82-5	Aroclor-1260	73	P

J,g

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

D-5

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 27 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/21/02

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	220	U
11104-28-2	Aroclor-1221	290	U
11141-16-5	Aroclor-1232	220	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	960	
11096-82-5	Aroclor-1260	260	P

J,g

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

EPA SAMPLE NO.

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

40SB4F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB5A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB5C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-5

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-5RR

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/26/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/08/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

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1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT2BP

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/26/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/08/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/26/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/08/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ,r
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ,r
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ, Y
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	UUJ,Y
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ,Y
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	UUJ,r
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	UUJ,r
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ,V
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ,r
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	UUJ,Y
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB5A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	UJ,C
479-45-8	Tetryl	2.0	U	
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB5C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ,Y
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/15/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/23/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U UJ,C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ,r
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ/Y
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ|r
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/19/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-5

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/16/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/20/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/03/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT2BP

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/26/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ1Y
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: T2788-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/26/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U UJ
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-12

Level (low/med): LOW Date Received: 11/16/02

% Solids: 82.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13700		*	P	J,K
7440-36-0	Antimony	0.92	B	N	P	L,M
7440-38-2	Arsenic	53.1		*	P	J,K
7440-39-3	Barium	82.3		*	P	↓
7440-41-7	Beryllium	0.66			P	
7440-43-9	Cadmium	0.75			P	
7440-70-2	Calcium	8830		*	P	J,K
7440-47-3	Chromium	28.8		N*	P	
7440-48-4	Cobalt	6.1		*	P	
7440-50-8	Copper	52.2		N*	P	
7439-89-6	Iron	32000		*	P	
7439-92-1	Lead	89.6		*	P	
7439-95-4	Magnesium	5550		*	P	
7439-96-5	Manganese	236		*	P	
7439-97-6	Mercury	2.1		*	CV	
7440-02-0	Nickel	14.4		*	P	↓
7440-09-7	Potassium	1180		E	P	J,S
7782-49-2	Selenium	3.3		*	P	J,K
7440-22-4	Silver	0.20	B		P	
7440-23-5	Sodium	324			P	L,W
7440-28-0	Thallium	0.59	U	N*	P	R,M
7440-62-2	Vanadium	39.7		*	P	J,K
7440-66-6	Zinc	148		*	P	↓

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB1B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-6

Level (low/med): LOW Date Received: 11/16/02

% Solids: 72.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21700		*	P	J,K
7440-36-0	Antimony	0.50	U	N	P	UL,M
7440-38-2	Arsenic	3.0		*	P	J,K
7440-39-3	Barium	69.2		*	P	↓
7440-41-7	Beryllium	1.2			P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1150		*	P	J,K
7440-47-3	Chromium	37.6		N*	P	
7440-48-4	Cobalt	11.3		*	P	
7440-50-8	Copper	14.6		N*	P	
7439-89-6	Iron	27300		*	P	
7439-92-1	Lead	9.9		*	P	
7439-95-4	Magnesium	16000		*	P	
7439-96-5	Manganese	952		*	P	↓
7439-97-6	Mercury	0.022	U	*	CV	UJ,K
7440-02-0	Nickel	20.9		*	P	J,K
7440-09-7	Potassium	3500		E	P	J,S
7782-49-2	Selenium	1.9		*	P	J,K
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	674			P	
7440-28-0	Thallium	0.69	U	N*	P	R,M
7440-62-2	Vanadium	61.6		*	P	J,K
7440-66-6	Zinc	43.4		*	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.: 40SB1C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-7

Level (low/med): LOW Date Received: 11/16/02

% Solids: 70.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	36500		*	P	J,K
7440-36-0	Antimony	0.49	U	N	P	UL,M
7440-38-2	Arsenic	6.0		*	P	J,K
7440-39-3	Barium	63.9		*	P	↓
7440-41-7	Beryllium	1.8			P	
7440-43-9	Cadmium	0.35	B		P	
7440-70-2	Calcium	12700		*	P	J,K
7440-47-3	Chromium	36.8		N*	P	
7440-48-4	Cobalt	6.0		*	P	
7440-50-8	Copper	34.0		N*	P	
7439-89-6	Iron	30300		*	P	
7439-92-1	Lead	7.4		*	P	
7439-95-4	Magnesium	20900		*	P	
7439-96-5	Manganese	374		*	P	
7439-97-6	Mercury	0.057		*	CV	
7440-02-0	Nickel	27.3		*	P	↓
7440-09-7	Potassium	3370		E	P	J,S
7782-49-2	Selenium	0.79		*	P	K,W
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	239	B		P	L,W
7440-28-0	Thallium	0.68	U	N*	P	R,M
7440-62-2	Vanadium	54.4		*	P	J,K
7440-66-6	Zinc	41.8		*	P	↓

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.: 40SB1F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-13

Level (low/med): LOW Date Received: 11/16/02

% Solids: 54.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14100		*	P	J,K
7440-36-0	Antimony	1.2	B	N	P	L,M
7440-38-2	Arsenic	95.6		*	P	J,K
7440-39-3	Barium	108		*	P	↓
7440-41-7	Beryllium	0.73	B		P	
7440-43-9	Cadmium	0.98			P	
7440-70-2	Calcium	11400		*	P	J,K
7440-47-3	Chromium	25.3		N*	P	
7440-48-4	Cobalt	7.7		*	P	
7440-50-8	Copper	34.3		N*	P	
7439-89-6	Iron	105000		*	P	
7439-92-1	Lead	51.9		*	P	
7439-95-4	Magnesium	6330		*	P	
7439-96-5	Manganese	527		*	P	
7439-97-6	Mercury	0.38		*	CV	
7440-02-0	Nickel	19.0		*	P	
7440-09-7	Potassium	2240		E	P	J,S
7782-49-2	Selenium	12.6		*	P	J,K
7440-22-4	Silver	0.40	B		P	
7440-23-5	Sodium	565			P	L,W
7440-28-0	Thallium	0.86	U	N*	P	R,M
7440-62-2	Vanadium	35.9		*	P	J,K
7440-66-6	Zinc	106		*	P	↓

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.: 40SB2A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-8

Level (low/med): LOW Date Received: 11/16/02

% Solids: 81.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	19600		*	P	J,K
7440-36-0	Antimony	0.70	B	N	P	L,M
7440-38-2	Arsenic	4.5		*	P	J,K
7440-39-3	Barium	53.9		*	P	↓
7440-41-7	Beryllium	0.48	B		P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	2840		*	P	J,K
7440-47-3	Chromium	24.3		N*	P	
7440-48-4	Cobalt	6.0		*	P	
7440-50-8	Copper	3.0		N*	P	
7439-89-6	Iron	27000		*	P	
7439-92-1	Lead	20.6		*	P	
7439-95-4	Magnesium	2230		*	P	
7439-96-5	Manganese	231		*	P	
7439-97-6	Mercury	0.12		*	CV	
7440-02-0	Nickel	7.4		*	P	↓
7440-09-7	Potassium	1110		E	P	J,S
7782-49-2	Selenium	1.8		*	P	J,K
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	143	B		P	L,W
7440-28-0	Thallium	0.61	U	N*	P	R,M
7440-62-2	Vanadium	53.5		*	P	J,K
7440-66-6	Zinc	38.5		*	P	↓

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-10

Level (low/med): LOW Date Received: 11/16/02

% Solids: 75.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	30900		*	P	J,K
7440-36-0	Antimony	0.45	U	N	P	UL,M
7440-38-2	Arsenic	2.9		*	P	J,K
7440-39-3	Barium	62.0		*	P	↓
7440-41-7	Beryllium	1.5			P	
7440-43-9	Cadmium	0.25	B		P	
7440-70-2	Calcium	961		*	P	J,K
7440-47-3	Chromium	36.0		N*	P	
7440-48-4	Cobalt	5.3		*	P	
7440-50-8	Copper	31.8		N*	P	
7439-89-6	Iron	27400		*	P	
7439-92-1	Lead	7.1		*	P	
7439-95-4	Magnesium	20000		*	P	
7439-96-5	Manganese	269		*	P	
7439-97-6	Mercury	0.031	B	*	CV	
7440-02-0	Nickel	26.2		*	P	↓
7440-09-7	Potassium	3340		E	P	J,S
7782-49-2	Selenium	1.4		*	P	J,K
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	3740			P	
7440-28-0	Thallium	0.62	U	N*	P	R,M
7440-62-2	Vanadium	53.7		*	P	J,K
7440-66-6	Zinc	43.2		*	P	↓

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-11

Level (low/med): LOW Date Received: 11/16/02

% Solids: 67.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	37400		*	P	J,K
7440-36-0	Antimony	0.74	B	N	P	L,M
7440-38-2	Arsenic	2.9		*	P	L,W
7440-39-3	Barium	62.9		*	P	J,K
7440-41-7	Beryllium	1.8			P	
7440-43-9	Cadmium	0.37	B		P	
7440-70-2	Calcium	873		*	P	J,K
7440-47-3	Chromium	50.1		N*	P	
7440-48-4	Cobalt	9.6		*	P	
7440-50-8	Copper	32.2		N*	P	
7439-89-6	Iron	35900		*	P	
7439-92-1	Lead	4.8		*	P	
7439-95-4	Magnesium	34100		*	P	
7439-96-5	Manganese	132		*	P	
7439-97-6	Mercury	0.022	U	*	CV	
7440-02-0	Nickel	34.5		*	P	↓
7440-09-7	Potassium	6280		E	P	J,S
7782-49-2	Selenium	0.97		*	P	K,W
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	4690			P	
7440-28-0	Thallium	0.74	U	N*	P	R,M
7440-62-2	Vanadium	67.7		*	P	J,K
7440-66-6	Zinc	51.1		*	P	↓

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-9

Level (low/med): LOW Date Received: 11/16/02

% Solids: 76.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14100		*	P	J,K
7440-36-0	Antimony	0.44	U	N	P	UL,M
7440-38-2	Arsenic	3.7		*	P	J,K
7440-39-3	Barium	83.0		*	P	↓
7440-41-7	Beryllium	0.62			P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1930		*	P	J,K
7440-47-3	Chromium	17.9		N*	P	↓
7440-48-4	Cobalt	8.0		*	P	↓
7440-50-8	Copper	0.17	U	N*	P	R,M
7439-89-6	Iron	22100		*	P	J,K
7439-92-1	Lead	23.7		*	P	↓
7439-95-4	Magnesium	2440		*	P	↓
7439-96-5	Manganese	418		*	P	↓
7439-97-6	Mercury	0.28		*	CV	↓
7440-02-0	Nickel	10.9		*	P	↓
7440-09-7	Potassium	1530		E	P	J,S
7782-49-2	Selenium	1.5		*	P	J,K
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	267			P	L,W
7440-28-0	Thallium	0.61	U	N*	P	R,M
7440-62-2	Vanadium	34.8		*	P	J,K
7440-66-6	Zinc	48.3		*	P	↓

Color Before: BLACK Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-4

Level (low/med): LOW Date Received: 11/15/02

% Solids: 84.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	28500		*	P	J,K
7440-36-0	Antimony	0.55	B	N	P	L,M
7440-38-2	Arsenic	2.9		*	P	J,C
7440-39-3	Barium	61.4		*	P	↓
7440-41-7	Beryllium	1.5			P	
7440-43-9	Cadmium	0.24	B		P	
7440-70-2	Calcium	4160		*	P	J,C
7440-47-3	Chromium	33.7		N*	P	
7440-48-4	Cobalt	6.8		*	P	
7440-50-8	Copper	12.0		N*	P	
7439-89-6	Iron	22100		*	P	
7439-92-1	Lead	11.1		*	P	
7439-95-4	Magnesium	24400		*	P	
7439-96-5	Manganese	511		*	P	
7439-97-6	Mercury	0.078		*	CV	
7440-02-0	Nickel	20.9		*	P	↓
7440-09-7	Potassium	5240		E	P	J,S
7782-49-2	Selenium	1.1		*	P	K,W
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	274			P	L,W
7440-28-0	Thallium	0.57	U	N*	P	R,M
7440-62-2	Vanadium	45.0		*	P	J,C
7440-66-6	Zinc	77.9		*	P	↓

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-5

Level (low/med): LOW Date Received: 11/15/02

% Solids: 67.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7460		*	P	J,K
7440-36-0	Antimony	3.1		N	P	L,M
7440-38-2	Arsenic	51.0		*	P	J,K
7440-39-3	Barium	110		*	P	↓
7440-41-7	Beryllium	0.32	B		P	
7440-43-9	Cadmium	1.1			P	
7440-70-2	Calcium	31100		*	P	J,K
7440-47-3	Chromium	38.5		N*	P	
7440-48-4	Cobalt	8.6		*	P	
7440-50-8	Copper	77.7		N*	P	
7439-89-6	Iron	130000		*	P	
7439-92-1	Lead	206		*	P	
7439-95-4	Magnesium	11300		*	P	
7439-96-5	Manganese	623		*	P	
7439-97-6	Mercury	1.9		*	CV	
7440-02-0	Nickel	34.8		*	P	↓
7440-09-7	Potassium	1070		E	P	J,S
7782-49-2	Selenium	5.7		*	P	J,K
7440-22-4	Silver	0.99			P	
7440-23-5	Sodium	930			P	
7440-28-0	Thallium	0.70	U	N*	P	R,M
7440-62-2	Vanadium	11.6		*	P	J,K
7440-66-6	Zinc	316		*	P	↓

Color Before: BLACK Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

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SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB5A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-1

Level (low/med): LOW Date Received: 11/15/02

% Solids: 83.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	16600		*	P	J,K
7440-36-0	Antimony	0.53	B	N	P	L,M
7440-38-2	Arsenic	4.3		*	P	J,K
7440-39-3	Barium	19.2		*	P	↓
7440-41-7	Beryllium	0.35	B		P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	8210		*	P	J,K
7440-47-3	Chromium	17.9		N*	P	
7440-48-4	Cobalt	3.3		*	P	
7440-50-8	Copper	5.9		N*	P	
7439-89-6	Iron	21600		*	P	
7439-92-1	Lead	18.2		*	P	
7439-95-4	Magnesium	4260		*	P	
7439-96-5	Manganese	117		*	P	
7439-97-6	Mercury	0.084		*	CV	
7440-02-0	Nickel	7.3		*	P	
7440-09-7	Potassium	502		E	P	J,S
7782-49-2	Selenium	1.3		*	P	J,K
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	219	B		P	L,W
7440-28-0	Thallium	0.58	U	N*	P	R,M
7440-62-2	Vanadium	43.5		*	P	J,K
7440-66-6	Zinc	113		*	P	↓

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB5C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-3

Level (low/med): LOW Date Received: 11/15/02

% Solids: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14400		*	P	J,K
7440-36-0	Antimony	0.53	B	N	P	L,M
7440-38-2	Arsenic	0.27	U	*	P	U,W
7440-39-3	Barium	25.7		*	P	J,K
7440-41-7	Beryllium	0.69			P	
7440-43-9	Cadmium	0.30	B		P	
7440-70-2	Calcium	102000		*	P	J,K
7440-47-3	Chromium	21.9		N*	P	
7440-48-4	Cobalt	5.3		*	P	
7440-50-8	Copper	3.5		N*	P	
7439-89-6	Iron	18500		*	P	
7439-92-1	Lead	2.4		*	P	
7439-95-4	Magnesium	66200		*	P	
7439-96-5	Manganese	198		*	P	
7439-97-6	Mercury	0.019	U	*	CV	
7440-02-0	Nickel	15.0		*	P	
7440-09-7	Potassium	3880		E	P	J,S
7782-49-2	Selenium	0.36	U	*	P	U,J,K
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	1790			P	
7440-28-0	Thallium	0.56	U	N*	P	R,M
7440-62-2	Vanadium	31.6		*	P	J,K
7440-66-6	Zinc	30.8		*	P	

Color Before: GREEN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB5F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-2

Level (low/med): LOW Date Received: 11/15/02

% Solids: 57.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	26100		*	P	J,K
7440-36-0	Antimony	0.62	B	N	P	L,M
7440-38-2	Arsenic	4.0		*	P	J,K
7440-39-3	Barium	71.2		*	P	↓
7440-41-7	Beryllium	1.4			P	
7440-43-9	Cadmium	0.57	B		P	
7440-70-2	Calcium	19200		*	P	J,K
7440-47-3	Chromium	40.6		N*	P	
7440-48-4	Cobalt	9.4		*	P	
7440-50-8	Copper	98.2		N*	P	
7439-89-6	Iron	35100		*	P	
7439-92-1	Lead	62.0		*	P	
7439-95-4	Magnesium	28900		*	P	
7439-96-5	Manganese	325		*	P	
7439-97-6	Mercury	0.23		*	CV	
7440-02-0	Nickel	27.8		*	P	↓
7440-09-7	Potassium	3180		E	P	J,S
7782-49-2	Selenium	1.9		*	P	J,K
7440-22-4	Silver	0.17	B		P	
7440-23-5	Sodium	1960			P	
7440-28-0	Thallium	0.83	U	N*	P	R,M
7440-62-2	Vanadium	52.6		*	P	J,K
7440-66-6	Zinc	79.4		*	P	↓

Color Before: BLACK Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

71SB11B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-17

Level (low/med): LOW Date Received: 11/19/02

% Solids: 71.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	45100		*	P	J,K
7440-36-0	Antimony	0.49	U	N	P	UL,M
7440-38-2	Arsenic	5.6		*	P	J,K
7440-39-3	Barium	66.2		*	P	↓
7440-41-7	Beryllium	2.6			P	
7440-43-9	Cadmium	0.21	B		P	
7440-70-2	Calcium	1510		*	P	J,K
7440-47-3	Chromium	57.6		N*	P	
7440-48-4	Cobalt	8.0		*	P	
7440-50-8	Copper	26.0		N*	P	
7439-89-6	Iron	44500		*	P	
7439-92-1	Lead	11.9		*	P	
7439-95-4	Magnesium	6210		*	P	
7439-96-5	Manganese	348		*	P	
7439-97-6	Mercury	0.15		*	CV	
7440-02-0	Nickel	36.4		*	P	↓
7440-09-7	Potassium	2520		E	P	J,S
7782-49-2	Selenium	2.0		*	P	J,K
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	196	B		P	L,W
7440-28-0	Thallium	0.67	U	N*	P	R,M
7440-62-2	Vanadium	79.9		*	P	J,K
7440-66-6	Zinc	47.8		*	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

71SB11C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-18

Level (low/med): LOW Date Received: 11/19/02

% Solids: 70.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	42800		*	P	J,K
7440-36-0	Antimony	0.48	U	N	P	U,L,M
7440-38-2	Arsenic	4.0		*	P	J,K
7440-39-3	Barium	78.3		*	P	↓
7440-41-7	Beryllium	2.3			P	
7440-43-9	Cadmium	0.38	B		P	
7440-70-2	Calcium	2060		*	P	J,K
7440-47-3	Chromium	33.2		N*	P	
7440-48-4	Cobalt	8.9		*	P	
7440-50-8	Copper	39.1		N*	P	
7439-89-6	Iron	28900		*	P	
7439-92-1	Lead	6.7		*	P	
7439-95-4	Magnesium	33000		*	P	
7439-96-5	Manganese	375		*	P	
7439-97-6	Mercury	0.057		*	CV	
7440-02-0	Nickel	27.2		*	P	↓
7440-09-7	Potassium	5460		E	P	J,S
7782-49-2	Selenium	1.0		*	P	K,W
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	122	B		P	L,W
7440-28-0	Thallium	0.67	U	N*	P	R,M
7440-62-2	Vanadium	57.9		*	P	J,K
7440-66-6	Zinc	44.7		*	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-16

Level (low/med): LOW Date Received: 11/19/02

% Solids: 79.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	18600		*	P	J,K
7440-36-0	Antimony	0.43	U	N	P	UL,M
7440-38-2	Arsenic	9.5		*	P	J,K
7440-39-3	Barium	139		*	P	↓
7440-41-7	Beryllium	0.83			P	
7440-43-9	Cadmium	0.43	B		P	
7440-70-2	Calcium	3380		*	P	J,K
7440-47-3	Chromium	66.0		N*	P	
7440-48-4	Cobalt	8.7		*	P	
7440-50-8	Copper	23.2		N*	P	
7439-89-6	Iron	21600		*	P	
7439-92-1	Lead	119		*	P	
7439-95-4	Magnesium	5510		*	P	
7439-96-5	Manganese	368		*	P	
7439-97-6	Mercury	0.16		*	CV	
7440-02-0	Nickel	30.7		*	P	↓
7440-09-7	Potassium	1820		E	P	J,S
7782-49-2	Selenium	2.0		*	P	J,K
7440-22-4	Silver	1.3			P	
7440-23-5	Sodium	260			P	L,W
7440-28-0	Thallium	0.59	U	N*	P	R,M
7440-62-2	Vanadium	38.8		*	P	J,K
7440-66-6	Zinc	73.3		*	P	↓

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

71SS13

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-15

Level (low/med): LOW Date Received: 11/19/02

% Solids: 94.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3460		*	P	J,K
7440-36-0	Antimony	16.4		N	P	L,M
7440-38-2	Arsenic	9.7		*	P	J,C
7440-39-3	Barium	101		*	P	↓
7440-41-7	Beryllium	0.68			P	
7440-43-9	Cadmium	0.13	B		P	
7440-70-2	Calcium	2610		*	P	J,C
7440-47-3	Chromium	14.4		N*	P	
7440-48-4	Cobalt	3.7		*	P	
7440-50-8	Copper	28.0		N*	P	
7439-89-6	Iron	11100		*	P	
7439-92-1	Lead	366		*	P	
7439-95-4	Magnesium	1290		*	P	
7439-96-5	Manganese	83.7		*	P	
7439-97-6	Mercury	0.25		*	CV	
7440-02-0	Nickel	19.9		*	P	↓
7440-09-7	Potassium	378		E	P	J,S
7782-49-2	Selenium	1.1		*	P	J,K
7440-22-4	Silver	0.12	B		P	
7440-23-5	Sodium	358			P	L,W
7440-28-0	Thallium	0.51	U	N*	P	R,M
7440-62-2	Vanadium	11.6		*	P	J,C
7440-66-6	Zinc	152		*	P	↓

Color Before: BLACK Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-5

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-14

Level (low/med): LOW Date Received: 11/16/02

% Solids: 73.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13500		*	P	J,K
7440-36-0	Antimony	0.86	B	N	P	L,M
7440-38-2	Arsenic	38.3		*	P	J,K
7440-39-3	Barium	80.1		*	P	↓
7440-41-7	Beryllium	0.52	B		P	
7440-43-9	Cadmium	1.0			P	
7440-70-2	Calcium	4670		*	P	J,K
7440-47-3	Chromium	22.5		N*	P	
7440-48-4	Cobalt	5.9		*	P	
7440-50-8	Copper	38.3		N*	P	
7439-89-6	Iron	28300		*	P	
7439-92-1	Lead	65.7		*	P	
7439-95-4	Magnesium	4130		*	P	
7439-96-5	Manganese	336		*	P	
7439-97-6	Mercury	2.1		*	CV	
7440-02-0	Nickel	12.8		*	P	
7440-09-7	Potassium	1140		E	P	J,S
7782-49-2	Selenium	2.3		*	P	J,K
7440-22-4	Silver	0.74			P	
7440-23-5	Sodium	672			P	
7440-28-0	Thallium	0.65	U	N*	P	R,M
7440-62-2	Vanadium	23.8		*	P	J,K
7440-66-6	Zinc	128		*	P	↓

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

TESTPIT2BP

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-20

Level (low/med): LOW Date Received: 11/21/02

% Solids: 75.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	24000		*	P	J,K
7440-36-0	Antimony	0.54	B	N	P	L,M
7440-38-2	Arsenic	2.3		*	P	L,W
7440-39-3	Barium	49.5		*	P	J,K
7440-41-7	Beryllium	3.0			P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1180		*	P	J,K
7440-47-3	Chromium	33.8		N*	P	
7440-48-4	Cobalt	7.2		*	P	
7440-50-8	Copper	28.6		N*	P	
7439-89-6	Iron	36000		*	P	
7439-92-1	Lead	18.7		*	P	
7439-95-4	Magnesium	7610		*	P	
7439-96-5	Manganese	607		*	P	
7439-97-6	Mercury	0.12		*	CV	
7440-02-0	Nickel	30.7		*	P	
7440-09-7	Potassium	1410		E	P	J,S
7782-49-2	Selenium	1.9		*	P	J,K
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	1170			P	
7440-28-0	Thallium	0.66	U	N*	P	R,M
7440-62-2	Vanadium	49.3		*	P	J,K
7440-66-6	Zinc	34.0		*	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Lab Sample ID: T2788-19

Level (low/med): LOW Date Received: 11/21/02

% Solids: 80.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4950		*	P	J,K
7440-36-0	Antimony	1.2	B	N	P	L,M
7440-38-2	Arsenic	74.6		*	P	J,K
7440-39-3	Barium	65.2		*	P	L
7440-41-7	Beryllium	0.58	B		P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1320		*	P	J,K
7440-47-3	Chromium	12.2		N*	P	↓
7440-48-4	Cobalt	8.1		*	P	
7440-50-8	Copper	80.6		N*	P	L,W
7439-89-6	Iron	34600		*	P	J,K
7439-92-1	Lead	35.4		*	P	
7439-95-4	Magnesium	1530		*	P	
7439-96-5	Manganese	274		*	P	
7439-97-6	Mercury	0.49		*	CV	
7440-02-0	Nickel	17.1		*	P	↓
7440-09-7	Potassium	1100		E	P	J,S
7782-49-2	Selenium	7.0		*	P	J,K
7440-22-4	Silver	0.60	B		P	
7440-23-5	Sodium	207	B		P	L,W
7440-28-0	Thallium	0.64	U	N*	P	R,M
7440-62-2	Vanadium	10.7		*	P	J,K
7440-66-6	Zinc	62.3		*	P	↓

Color Before: BLACK Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

27

DATA VALIDATION WORKSHEET

Volatile Organic Analysis by GC/MS

Reviewer: RA
Date: 1/23/03
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: T2788
Test Name: 8260B
Method No.: VOC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If the temperature of the cooler was elevated (> 10 °C) or bubble size in aqueous sample was too big (tiny bubble is OK.), then flag all positive results with a "L" and all non-detects "UL".		✓	
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP? QAPP say - no HCl preservation.	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous unpreserved - 7 days for aromatic compounds All others - 14 days.	✓		
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

collected	analyzed	
11/15/02	11/29/02	405B4FRE 5days
11/14/02	11/28/02	405B5FRE 4days
11/18/02	11/29/02	405B5CRE 4 4
11/20/02	11/29/02	405B9FRE 4
SOIL		

12/3/02 → 12/2/02

L, UL, h unless flagged for blank contamination

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per GCMS, 20 samples, batch, matrix, and level)?	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common volatile lab contaminants - methylene chloride, acetone, and 2-butanone) the amount in the associated blank.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If Yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the DV report.	✓		

Notes: See attached pos<5x B, Z
↓EQB from SDG R2788 MCl3 <10x → B, X toluene were prev flagged no more
trip " " all prev. flagged

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 15% and %D < ± 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < CL? CL >0.10 for chloromethane, 1,1-dichloroethane, & bromoform or >0.30 for chlorobenzene & 1,1,2,2-tetrachloroethane. If yes, L(+)/R(-).		✓	

Notes: IC 11/28/02 toluene 25.4 %RSD pos results were prev. flagged -
Several %D7 QC See attached.

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	✓		
5.2	Are BFB enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
5.3	Have all samples been analyzed within twelve hours of the BFB tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for BFB been met for each instrument used?	✓		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?		✓	
	If any system monitoring compound(s) in the volatile fraction is out of specification, there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? DV report should indicate that extraction efficiency/ method accuracy cannot be verified.			✓
		1 or more <10% / 1 high/low / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high		
	Positives: L / J / J / L / K			
	Non-detects: R / UJ / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes: All Surr. & QC 405B5A
405B5F
405B5C
405B6A
405B 4F

Pos K/S unless prev flagged

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached LCS ori; NO action.

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).		✓	
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes: ~~405B5A all <QC~~ severe loss of IS for 405B5A, 405B5F, 405B5C, 405B4A, 405B4F, 405B2F, all rejected use re-analyses.
TESTPIT2F 1,4-dichlorobenzene < QC associated results ND, UJ, i
405B2FRE " " "

10.0 Field Duplicate		Yes	No	NA
10.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes:

405B1F and [redacted] D-5

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".	✓		

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓	✓	
12.1.1	Number of samples: 26			
12.1.2	Number of target compounds in each analysis: 48			
12.1.3	Number of results rejected and not reported: 268			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 79%			

Notes:

RA 11/29/03

	40SB1F		D-5	RPD
carbon disulfide	10		2 ✓	
acetone	34		37	8%
benzene	15		12 ✓	
ethylbenzene	0.9		1 ✓	
xylene	2		2 ✓	
cyclohexane	2	RL=9	ND ✓ OK ✓	
methylcyclohexane	1	RL=9	ND OK ✓	
trichloroethene	4		7 ✓	
isopropylbenzene	0.8	RL=9	ND OK ✓	

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NC

VBLKVT

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID: WG21489-1B59 Lab Sample ID: WG21489-1A

Date Analyzed: 11/28/02 Time Analyzed: 1851

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972HP59

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VTLLCS	WG21489-4	WG21489-4B59	1921
02	40SB5A	T2788-1	T2788-1B59	1946
03	40SB5F	T2788-2	T2788-2B59	2012
04	40SB5C	T2788-3	T2788-3B59	2037
05	40SB4A	T2788-4	T2788-4B59	2103
06	40SB4F	T2788-5	T2788-5B59	2129
07	40SB1B	T2788-6	T2788-6B59	0001
08	40SB1C	T2788-7	T2788-7B59	0027
09	40SB2A	T2788-8	T2788-8B59	0053
10	40SB2F	T2788-9	T2788-9B59	0118
11	40SB2B	T2788-10	T2788-10B59	0143
12	40SB2C	T2788-11	T2788-11B59	0209
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVT

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1A

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1B59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	4	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVT

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1A

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1B59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	0.5	J
106-46-7	1,4-Dichlorobenzene	0.4	J
95-50-1	1,2-Dichlorobenzene	0.5	J
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	4	J
1330-20-7	Xylene (total)	15	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO

VBLKVX

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID: WG21489-1A59 Lab Sample ID: WG21489-1

Date Analyzed: 11/29/02 Time Analyzed: 1203

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972HP59

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VVXLCS	WG21489-4	WG21489-4A59	1229
02	D-5	T2788-14	T2788-14A59	1411
03	71SB11B	T2788-17	T2788-17A59	1528
04	71SB11C	T2788-18	T2788-18A59	1553
05	TESTPIT2F	T2788-19	T2788-19A59	1618
06	TESTPIT2FMS	WG21489-6	WG21489-6A59	1644
07	TESTPIT2FMSD	WG21489-7	WG21489-7A59	1709
08	TESTPIT2BP	T2788-20	T2788-20A59	1735
09	40SB1F	T2788-13	T2788-13RA59	1800
10	71SS13	T2788-15	T2788-15RA59	1826
11	71SB11F	T2788-16	T2788-16RA59	1851
12	40SB2FRE	T2788-9	T2788-9RA59	1916
13	40SB1A	T2788-12	T2788-12RA59	1942
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVX

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1A59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	1	J
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	2	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVX

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1A59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 11/29/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	0.3	J
106-46-7	1,4-Dichlorobenzene	0.3	J
95-50-1	1,2-Dichlorobenzene	0.3	J
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	1	J
1330-20-7	Xylene (total)	15	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE N(

VBLKVU

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID: WG21489-2A52 Lab Sample ID: WG21489-2

Date Analyzed: 12/03/02 Time Analyzed: 2057

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

Instrument ID: F50052

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VULCS	WG21489-5	WG21489-5A52	2128
02	40SB4FRE	T2788-5	T2788-5DA52	2159
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVU

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-2

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-2A52

Level: (low/med) MED Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/03/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:(5000)(ul) Soil Aliquot Volume: 100(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	250	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	250	U
74-83-9	Bromomethane	250	U
75-00-3	Chloroethane	250	U
75-69-4	Trichlorofluoromethane	250	U
75-35-4	1,1-Dichloroethene	250	U
75-15-0	Carbon disulfide	250	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	250	U
67-64-1	Acetone	630	U
75-09-2	Methylene Chloride	250	U
156-60-5	trans-1,2-Dichloroethene	250	U
1634-04-4	Methyl-tert-butyl ether	250	U
75-34-3	1,1-Dichloroethane	250	U
156-59-2	cis-1,2-Dichloroethene	250	U
78-93-3	2-butanone	630	U
67-66-3	Chloroform	250	U
71-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	250	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	250	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-pentanone	630	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	250	U
79-00-5	1,1,2-Trichloroethane	250	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-hexanone	630	U
124-48-1	Dibromochloromethane	250	U
106-93-4	1,2-Dibromoethane	250	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVU

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-2

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-2A52

Level: (low/med) MED Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/03/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:(5000)(ul) Soil Aliquot Volume: 100(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	250	U
100-42-5	Styrene	250	U
75-25-2	Bromoform	250	U
98-82-8	Isopropyl Benzene	250	U
79-34-5	1,1,2,2-Tetrachloroethane	250	U
541-73-1	1,3-Dichlorobenzene	250	U
106-46-7	1,4-Dichlorobenzene	250	U
95-50-1	1,2-Dichlorobenzene	250	U
96-12-8	1,2-Dibromo-3-Chloropropane	250	U
120-82-1	1,2,4-Trichlorobenzene	250	U
1330-20-7	Xylene (total)	250	U
79-20-9	Methyl acetate	100	J
110-82-7	Cyclohexane	250	U
108-87-2	Methylcyclohexane	250	U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE N

VBLKVY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID: WG21489-1A59 Lab Sample ID: WG21489-1B

Date Analyzed: 12/02/02 Time Analyzed: 1256

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972HP59

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VVYLCS	WG21489-4	WG21489-4A59	1348
02	40SB5FRE	T2788-2	T2788-2RA59	1458
03	40SB5CRE	T2788-3	T2788-3RA59	1523
04	40SB4ARE	T2788-4	T2788-4RA59	1547
05	40SB5ARE	T2788-1	T2788-1R2A59	1636
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVY

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1B

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1A59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVY

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1B

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1A59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	0.3	J
106-46-7	1,4-Dichlorobenzene	0.3	J
95-50-1	1,2-Dichlorobenzene	0.2	J
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	0.8	J
1330-20-7	Xylene (total)	15	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1096

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-15

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-15B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,E
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1094

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-17

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-17B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,N
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1022

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-13

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-13B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,Z
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1020

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-11

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-11B52

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	2	JB B,J
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	4	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-9

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-9A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	3	J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	2	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-8A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	3	J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-8A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-4

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-8

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-8A52

Level: (low/med) LOW Date Received: 11/15/02

% Moisture: not dec. _____ Date Analyzed: 11/26/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-10B52

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	2	JB B,Z
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-10B52

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	0.9	JB B,Z
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	UJ, C
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-5

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-10

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-10B52

Level: (low/med) LOW Date Received: 11/16/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-12B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,Z
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	4	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-12B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	UJ,C
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-6

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-12

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-12B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-14B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	UUJ,C
74-87-3	Chloromethane	5	UUJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	2	JB
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	4	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-14B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____ (

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U UJ,C
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-14B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-16B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,Z
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-16B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
1330-20-7	Xylene (total)	5	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-16B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID: BF021128B59 BFB Injection Date: 11/28/02

Instrument ID: 5972HP59 BFB Injection Time: 1458

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.9
75	30.0 - 60.0% of mass 95	45.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.9
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	90.7
175	5.0 - 9.0% of mass 174	6.7 (7.3)1
176	95.0 - 101.0% of mass 174	89.3 (98.5)1
177	5.0 - 9.0% of mass 176	5.7 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD005	VSTD005	CS021128B59	11/28/02	1512
02	VSTD010	VSTD010	CT021128B59	11/28/02	1538
03	VSTD020	VSTD020	CU021128B59	11/28/02	1603
04	VSTD050	VSTD050	CV021128B59	11/28/02	1628
05	VSTD100	VSTD100	CW021128B59	11/28/02	1654
06	VSTD200	VSTD200	CX021128B59	11/28/02	1719
07	VBLKVT	WG21489-1A	WG21489-1B59	11/28/02	1851
08	VTLLCS	WG21489-4	WG21489-4B59	11/28/02	1921
09	40SB5A	T2788-1	T2788-1B59	11/28/02	1946
10	40SB5F	T2788-2	T2788-2B59	11/28/02	2012
11	40SB5C	T2788-3	T2788-3B59	11/28/02	2037
12	40SB4A	T2788-4	T2788-4B59	11/28/02	2103
13	40SB4F	T2788-5	T2788-5B59	11/28/02	2129
14	40SB1B	T2788-6	T2788-6B59	11/29/02	0001
15	40SB1C	T2788-7	T2788-7B59	11/29/02	0027
16	40SB2A	T2788-8	T2788-8B59	11/29/02	0053
17	40SB2F	T2788-9	T2788-9B59	11/29/02	0118
18	40SB2B	T2788-10	T2788-10B59	11/29/02	0143
19	40SB2C	T2788-11	T2788-11B59	11/29/02	0209
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: 5972HP59 Calibration Date(s): 11/28/02 11/28/02

Column: ZB624 ID: 0.32 (mm) Calibration Time(s): 1512 1719

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
Dichlorodifluoromethane	AVRG		0.58194483		14.548	15.000
Chloromethane	AVRG		0.38011958		12.264	15.000
Vinyl Chloride	AVRG		0.31132743		12.358	30.000
Bromomethane	AVRG		0.28505167		12.477	15.000
Chloroethane	AVRG		0.13602951		9.518	15.000
Trichlorofluoromethane	AVRG		0.62315875		8.848	15.000
1,1-Dichloroethene	AVRG		0.25167041		9.232	30.000
Carbon disulfide	AVRG		0.98029427		12.463	15.000
1,1,2-trichloro-1,2,2-triflu	2ORDR	-0.0455235	2.54271494	-0.2021518	0.9985746	0.9900000
Acetone	2ORDR	-0.4211162	39.5652122	-31.890444	0.9965309	0.9900000
Methylene Chloride	2ORDR	-0.0509946	4.49184604	-0.6857701	0.9977921	0.9900000
trans-1,2-Dichloroethene	AVRG		0.26576469		10.623	15.000
Methyl-tert-butyl ether	AVRG		0.41471586		10.259	15.000
1,1-Dichloroethane	AVRG		0.47548515		9.448	15.000
cis-1,2-Dichloroethene	AVRG		0.26158161		10.650	15.000
2-butanone	AVRG		0.05158196		9.812	15.000
Chloroform	AVRG		0.54653304		9.271	30.000
1,1,1-Trichloroethane	AVRG		0.48004021		8.709	15.000
Carbon Tetrachloride	AVRG		0.41737627		9.415	15.000
Benzene	AVRG		0.77004565		9.504	15.000
1,2-Dichloroethane	AVRG		0.35465501		8.258	15.000
Trichloroethene	AVRG		0.20561693		12.162	15.000
1,2-Dichloropropane	AVRG		0.21046408		8.851	30.000
Bromodichloromethane	AVRG		0.36300832		10.200	15.000
cis-1,3-Dichloropropene	AVRG		0.32416035		12.282	15.000
4-Methyl-2-pentanone	2ORDR	0.09689007	5.32632996	-0.2818983	0.9980348	0.9900000
Toluene	AVRG		1.00382401		25.468	30.000
trans-1,3-Dichloropropene	AVRG		0.49321268		9.768	15.000
1,1,2-Trichloroethane	AVRG		0.26996210		12.095	15.000
Tetrachloroethene	AVRG		0.32525381		13.234	15.000
2-hexanone	2ORDR	0.17421115	7.79902845	-0.5313186	0.9981738	0.9900000
Dibromochloromethane	AVRG		0.40819062		14.790	15.000
1,2-Dibromoethane	AVRG		0.32261357		13.546	15.000
Chlorobenzene	AVRG		0.87234265		10.776	15.000
Ethylbenzene	AVRG		0.42324742		11.950	30.000
Styrene	AVRG		0.84331753		14.387	15.000
Bromoform	2ORDR	0.03410376	3.86366011	-0.6091995	0.9984632	0.9900000
Isopropyl Benzene	AVRG		1.39888971		13.027	15.000
1,1,2,2-Tetrachloroethane	AVRG		0.68516489		9.330	15.000
1,3-Dichlorobenzene	AVRG		1.32404232		12.253	15.000
1,4-Dichlorobenzene	AVRG		1.36643276		10.360	15.000
1,2-Dichlorobenzene	AVRG		1.15134531		11.984	15.000
1,2-Dibromo-3-Chloropropane	AVRG		0.08106016		12.134	15.000
1,2,4-Trichlorobenzene	AVRG		0.67890148		11.066	15.000

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID: BF021129A59 BFB Injection Date: 11/29/02

Instrument ID: 5972HP59 BFB Injection Time: 1111

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.6
75	30.0 - 60.0% of mass 95	48.1
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	94.1
175	5.0 - 9.0% of mass 174	6.9 (7.4)1
176	95.0 - 101.0% of mass 174	93.1 (98.9)1
177	5.0 - 9.0% of mass 176	6.1 (6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	GS021129A59	11/29/02	1124
02	VBLKVX	WG21489-1	WG21489-1A59	11/29/02	1203
03	VVXLCS	WG21489-4	WG21489-4A59	11/29/02	1229
04	D-5	T2788-14	T2788-14A59	11/29/02	1411
05	71SB11B	T2788-17	T2788-17A59	11/29/02	1528
06	71SB11C	T2788-18	T2788-18A59	11/29/02	1553
07	TESTPIT2F	T2788-19	T2788-19A59	11/29/02	1618
08	TESTPIT2FMS	WG21489-6	WG21489-6A59	11/29/02	1644
09	TESTPIT2FMSD	WG21489-7	WG21489-7A59	11/29/02	1709
10	TESTPIT2BP	T2788-20	T2788-20A59	11/29/02	1735
11	40SB1F	T2788-13	T2788-13RA59	11/29/02	1800
12	71SS13	T2788-15	T2788-15RA59	11/29/02	1826
13	71SB11F	T2788-16	T2788-16RA59	11/29/02	1851
14	40SB2FRE	T2788-9	T2788-9RA59	11/29/02	1916
15	40SB1A	T2788-12	T2788-12RA59	11/29/02	1942
16					
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FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: 5972HP59 Calibration Date: 11/29/02 Time: 1124

Lab File ID: GS021129A59 Init. Calib. Date(s): 11/28/02 11/28/02

Init. Calib. Times: 1512 1719

GC Column: ZB624 ID: 0.32 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.5820000	0.6111191	0.6111191	0.001	5.00	90.00	AVRG
Chloromethane	0.3800000	0.3607252	0.3607252	0.1	-5.07	90.00	AVRG
Vinyl Chloride	0.3110000	0.3414881	0.3414881	0.001	9.80	20.00	AVRG
Bromomethane	0.2850000	0.2401175	0.2401175	0.001	-15.75	90.00	AVRG
Chloroethane ✓	0.1360000	0.1652458	0.1652458	0.001	21.50	90.00	AVRG
Trichlorofluoromethane	0.6230000	0.6812282	0.6812282	0.001	9.35	90.00	AVRG
1,1-Dichloroethene	0.2520000	0.2827589	0.2827589	0.001	12.20	20.00	AVRG
Carbon disulfide	0.9800000	1.0833663	1.0833663	0.001	10.55	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	285.41546	250.00000	0.4856477	0.001	14.17	90.00	2RDR
Acetone ✓	810.77406	625.00000	0.0403208	0.001	29.72	90.00	2RDR
Methylene Chloride	308.59051	250.00000	0.2998829	0.001	23.44	90.00	2RDR
trans-1,2-Dichloroethene	0.2660000	0.3033509	0.3033509	0.001	14.04	90.00	AVRG
Methyl-tert-butyl ether	0.4140000	0.4551696	0.4551696	0.001	9.94	90.00	AVRG
1,1-Dichloroethane	0.4760000	0.5220003	0.5220003	0.1	9.66	90.00	AVRG
cis-1,2-Dichloroethene	0.2620000	0.3059260	0.3059260	0.001	16.76	90.00	AVRG
2-butanone	0.0520000	0.0560064	0.0560064	0.001	7.70	90.00	AVRG
Chloroform	0.5460000	0.5929673	0.5929673	0.001	8.60	20.00	AVRG
1,1,1-Trichloroethane	0.4800000	0.5193059	0.5193059	0.001	8.19	90.00	AVRG
Carbon Tetrachloride	0.4170000	0.4601344	0.4601344	0.001	10.34	90.00	AVRG
Benzene	0.7700000	0.8616730	0.8616730	0.001	11.90	90.00	AVRG
1,2-Dichloroethane	0.3550000	0.3776007	0.3776007	0.001	6.37	90.00	AVRG
Trichloroethene	0.2060000	0.2345153	0.2345153	0.001	13.84	90.00	AVRG
1,2-Dichloropropane	0.2100000	0.2401765	0.2401765	0.001	14.37	20.00	AVRG
Bromodichloromethane	0.3630000	0.4117265	0.4117265	0.001	13.42	90.00	AVRG
cis-1,3-Dichloropropene	0.3240000	0.3772300	0.3772300	0.001	16.43	90.00	AVRG
4-Methyl-2-pentanone	618.28464	625.00000	0.1828781	0.001	-1.07	90.00	2RDR
Toluene	1.0040000	0.9812419	0.9812419	0.001	-2.27	20.00	AVRG
trans-1,3-Dichloropropene	0.4930000	0.5422102	0.5422102	0.001	9.98	90.00	AVRG
1,1,2-Trichloroethane	0.2700000	0.3024512	0.3024512	0.001	12.02	90.00	AVRG
Tetrachloroethene	0.3250000	0.3697033	0.3697033	0.001	13.75	90.00	AVRG
2-hexanone	626.89950	625.00000	0.1222199	0.001	0.30	90.00	2RDR
Dibromochloromethane	0.4080000	0.4521826	0.4521826	0.001	10.83	90.00	AVRG
1,2-Dibromoethane	0.3220000	0.3638890	0.3638890	0.001	13.01	90.00	AVRG
Chlorobenzene	0.8720000	1.0178101	1.0178101	0.3	16.72	90.00	AVRG
Ethylbenzene	0.4230000	0.5067004	0.5067004	0.001	19.79	20.00	AVRG
Styrene ✓	0.8430000	1.0163103	1.0163103	0.001	20.56	90.00	AVRG
Bromoform	276.26020	250.00000	0.2904870	0.1	10.50	90.00	2RDR
Isopropyl Benzene	1.3990000	1.6624579	1.6624579	0.001	18.83	90.00	AVRG
1,1,2,2-Tetrachloroethane	0.6850000	0.7272052	0.7272052	0.3	6.16	90.00	AVRG
1,3-Dichlorobenzene	1.3240000	1.5471545	1.5471545	0.001	16.85	90.00	AVRG
1,4-Dichlorobenzene	1.3660000	1.5672806	1.5672806	0.001	14.74	90.00	AVRG
1,2-Dichlorobenzene	1.1510000	1.3354051	1.3354051	0.001	16.02	90.00	AVRG

POS J,C

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: 5972HP59 Calibration Date: 11/29/02 Time: 1124

Lab File ID: GS021129A59 Init. Calib. Date(s): 11/28/02 11/28/02

Init. Calib. Times: 1512 1719

GC Column: ZB624 ID: 0.32 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dibromo-3-Chloropropane	0.0810000	0.1037652	0.1037652	0.001	28.10	90.00	AVRG
1,2,4-Trichlorobenzene	0.6790000	0.8060872	0.8060872	0.001	18.72	90.00	AVRG
Xylene (total)	0.5290000	0.6226696	0.6226696	0.001	17.71	90.00	AVRG
Methyl acetate	0.1030000	0.1052725	0.1052725	0.001	2.21	90.00	AVRG
Cyclohexane	0.3690000	0.4177485	0.4177485	0.001	13.21	90.00	AVRG
Methylcyclohexane	0.3000000	0.3661168	0.3661168	0.001	22.04	90.00	AVRG
Dibromofluoromethane	0.3360000	0.3790174	0.3790174	0.001	12.80	90.00	AVRG
1,2-Dichloroethane-d4	0.2960000	0.3096257	0.3096257	0.001	4.60	90.00	AVRG
Toluene-d8	1.1690000	1.3526094	1.3526094	0.001	15.71	90.00	AVRG
Bromofluorobenzene	1.0230000	1.1122300	1.1122300	0.001	8.72	90.00	AVRG

pos J, c

FORM VII VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID: BF021202A59 BFB Injection Date: 12/02/02

Instrument ID: 5972HP59 BFB Injection Time: 1107

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.6
75	30.0 - 60.0% of mass 95	44.5
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	90.6
175	5.0 - 9.0% of mass 174	6.9 (7.6)1
176	95.0 - 101.0% of mass 174	88.4 (97.6)1
177	5.0 - 9.0% of mass 176	5.8 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	GT021202A59	12/02/02	1217
02	VBLKVY	WG21489-1B	WG21489-1A59	12/02/02	1256
03	VVYLCS	WG21489-4	WG21489-4A59	12/02/02	1348
04	40SB5FRE	T2788-2	T2788-2RA59	12/02/02	1458
05	40SB5CRE	T2788-3	T2788-3RA59	12/02/02	1523
06	40SB4ARE	T2788-4	T2788-4RA59	12/02/02	1547
07	40SB5ARE	T2788-1	T2788-1R2A59	12/02/02	1636
08					
09					
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FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: 5972HP59 Calibration Date: 12/02/02 Time: 1217

Lab File ID: GT021202A59 Init. Calib. Date(s): 11/28/02 11/28/02

Init. Calib. Times: 1512 1719

GC Column: ZB624 ID: 0.32 (mm) all prev. passed

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.5820000	0.4828459	0.4828459	0.001	-17.04	90.00	AVRG
Chloromethane	0.3800000	0.3212536	0.3212536	0.1	-15.46	90.00	AVRG
Vinyl Chloride	0.3110000	0.3060492	0.3060492	0.001	-1.59	20.00	AVRG
Bromomethane ✓	0.2850000	0.2181095	0.2181095	0.001	-23.47	90.00	AVRG
Chloroethane	0.1360000	0.1516142	0.1516142	0.001	11.48	90.00	AVRG
Trichlorofluoromethane	0.6230000	0.5879387	0.5879387	0.001	-5.63	90.00	AVRG
1,1-Dichloroethene	0.2520000	0.2530503	0.2530503	0.001	0.42	20.00	AVRG
Carbon disulfide ✓	0.9800000	0.6706587	0.6706587	0.001	-31.56	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	231.03880	250.00000	0.3936770	0.001	-7.58	90.00	2RDR
Acetone	585.34110	625.00000	0.0297066	0.001	-6.34	90.00	2RDR
Methylene Chloride	271.17053	250.00000	0.2634249	0.001	8.47	90.00	2RDR
trans-1,2-Dichloroethene	0.2660000	0.2787611	0.2787611	0.001	4.80	90.00	AVRG
Methyl-tert-butyl ether	0.4140000	0.3682903	0.3682903	0.001	-11.04	90.00	AVRG
1,1-Dichloroethane	0.4760000	0.4507939	0.4507939	0.1	-5.30	90.00	AVRG
cis-1,2-Dichloroethene	0.2620000	0.2882515	0.2882515	0.001	10.02	90.00	AVRG
2-butanone	0.0520000	0.0451237	0.0451237	0.001	-13.22	90.00	AVRG
Chloroform	0.5460000	0.5087610	0.5087610	0.001	-6.82	20.00	AVRG
1,1,1-Trichloroethane	0.4800000	0.4508335	0.4508335	0.001	-6.08	90.00	AVRG
Carbon Tetrachloride	0.4170000	0.3951116	0.3951116	0.001	-5.25	90.00	AVRG
Benzene	0.7700000	0.8170357	0.8170357	0.001	6.11	90.00	AVRG
1,2-Dichloroethane	0.3550000	0.2977221	0.2977221	0.001	-16.13	90.00	AVRG
Trichloroethene	0.2060000	0.2300691	0.2300691	0.001	11.68	90.00	AVRG
1,2-Dichloropropane	0.2100000	0.2155403	0.2155403	0.001	2.64	20.00	AVRG
Bromodichloromethane	0.3630000	0.3417414	0.3417414	0.001	-5.86	90.00	AVRG
cis-1,3-Dichloropropene	0.3240000	0.3370390	0.3370390	0.001	4.02	90.00	AVRG
4-Methyl-2-pentanone	506.16897	625.00000	0.1476589	0.001	-19.01	90.00	2RDR
Toluene	1.0040000	0.9437863	0.9437863	0.001	-6.00	20.00	AVRG
trans-1,3-Dichloropropene	0.4930000	0.4587342	0.4587342	0.001	-6.95	90.00	AVRG
1,1,2-Trichloroethane	0.2700000	0.2816586	0.2816586	0.001	4.32	90.00	AVRG
Tetrachloroethene	0.3250000	0.3682922	0.3682922	0.001	13.32	90.00	AVRG
2-hexanone	511.29960	625.00000	0.0975818	0.001	-18.19	90.00	2RDR
Dibromochloromethane	0.4080000	0.3984848	0.3984848	0.001	-2.33	90.00	AVRG
1,2-Dibromoethane	0.3220000	0.3372480	0.3372480	0.001	4.74	90.00	AVRG
Chlorobenzene	0.8720000	0.9471709	0.9471709	0.3	8.62	90.00	AVRG
Ethylbenzene	0.4230000	0.4765210	0.4765210	0.001	12.65	20.00	AVRG
Styrene	0.8430000	0.9041180	0.9041180	0.001	7.25	90.00	AVRG
Bromoform	242.11612	250.00000	0.2518327	0.1	-3.15	90.00	2RDR
Isopropyl Benzene	1.3990000	1.5317454	1.5317454	0.001	9.49	90.00	AVRG
1,1,2,2-Tetrachloroethane	0.6850000	0.6796516	0.6796516	0.3	-0.78	90.00	AVRG
1,3-Dichlorobenzene	1.3240000	1.4467660	1.4467660	0.001	9.27	90.00	AVRG
1,4-Dichlorobenzene	1.3660000	1.4712163	1.4712163	0.001	7.70	90.00	AVRG
1,2-Dichlorobenzene	1.1510000	1.2266370	1.2266370	0.001	6.57	90.00	AVRG

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: 5972HP59 Calibration Date: 12/02/02 Time: 1217

Lab File ID: GT021202A59 Init. Calib. Date(s): 11/28/02 11/28/02

Init. Calib. Times: 1512 1719

GC Column: ZB624 ID: 0.32 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dibromo-3-Chloropropane	0.0810000	0.0965366	0.0965366	0.001	19.18	90.00	AVRG
1,2,4-Trichlorobenzene	0.6790000	0.7209704	0.7209704	0.001	6.18	90.00	AVRG
Xylene (total)	0.5290000	0.5750350	0.5750350	0.001	8.70	90.00	AVRG
Methyl acetate ✓	0.1030000	0.0774981	0.0774981	0.001	-24.76	90.00	AVRG
Cyclohexane	0.3690000	0.3466953	0.3466953	0.001	-6.04	90.00	AVRG
Methylcyclohexane	0.3000000	0.3545512	0.3545512	0.001	18.18	90.00	AVRG
Dibromofluoromethane	0.3360000	0.3844832	0.3844832	0.001	14.43	90.00	AVRG
1,2-Dichloroethane-d4	0.2960000	0.2649122	0.2649122	0.001	-10.50	90.00	AVRG
Toluene-d8	1.1690000	1.4311604	1.4311604	0.001	22.43	90.00	AVRG
Bromofluorobenzene	1.0230000	1.1430986	1.1430986	0.001	11.74	90.00	AVRG

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID: BF021203A52 BFB Injection Date: 12/03/02

Instrument ID: F50052 BFB Injection Time: 1038

GC Column: DB624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.0
75	30.0 - 60.0% of mass 95	44.5
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	53.1
175	5.0 - 9.0% of mass 174	3.7 (7.0)1
176	95.0 - 101.0% of mass 174	51.3 (96.5)1
177	5.0 - 9.0% of mass 176	3.3 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	CS021203A52	12/03/02	1100
02	VBLKVU	WG21489-2	WG21489-2A52	12/03/02	2057
03	VULCS	WG21489-5	WG21489-5A52	12/03/02	2128
04	40SB4FRE	T2788-5	T2788-5DA52	12/03/02	2159
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: F50052 Calibration Date: 12/03/02 Time: 1100

Lab File ID: CS021203A52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

GC Column: EQUITY624 ID: 0.53 (mm)

all Prev. flagged

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.5020000	0.4111708	0.4111708	0.001	-18.09	90.00	AVRG
Chloromethane	0.3250000	0.2967240	0.2967240	0.1	-8.70	90.00	AVRG
Vinyl Chloride	0.3200000	0.3252397	0.3252397	0.001	1.64	20.00	AVRG
Bromomethane	0.3490000	0.3503069	0.3503069	0.001	0.37	90.00	AVRG
Chloroethane	0.1800000	0.2044835	0.2044835	0.001	13.60	90.00	AVRG
Trichlorofluoromethane ✓	0.4800000	0.5833457	0.5833457	0.001	21.53	90.00	AVRG
1,1-Dichloroethene	0.2680000	0.2340132	0.2340132	0.001	-12.68	20.00	AVRG
Carbon disulfide ✓	0.9180000	0.6684413	0.6684413	0.001	-27.18	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	0.7630000	0.6736643	0.6736643	0.001	-11.71	90.00	AVRG
Acetone	632.90154	625.00000	0.0396594	0.001	1.26	90.00	2RDR
Methylene Chloride	244.20254	250.00000	0.3073938	0.001	-2.32	90.00	2RDR
trans-1,2-Dichloroethene	0.3150000	0.3123501	0.3123501	0.001	-0.84	90.00	AVRG
Methyl-tert-butyl ether	0.5510000	0.4824135	0.4824135	0.001	-12.45	90.00	AVRG
1,1-Dichloroethane	0.6460000	0.6545161	0.6545161	0.1	1.32	90.00	AVRG
cis-1,2-Dichloroethene	0.3300000	0.3361206	0.3361206	0.001	1.85	90.00	AVRG
2-butanone	0.0820000	0.0716818	0.0716818	0.001	-12.58	90.00	AVRG
Chloroform	0.6020000	0.6728781	0.6728781	0.001	11.77	20.00	AVRG
1,1,1-Trichloroethane	0.5000000	0.5590452	0.5590452	0.001	11.81	90.00	AVRG
Carbon Tetrachloride	0.4830000	0.5477024	0.5477024	0.001	13.40	90.00	AVRG
Benzene	0.9050000	0.8824311	0.8824311	0.001	-2.49	90.00	AVRG
1,2-Dichloroethane	0.2940000	0.3265927	0.3265927	0.001	11.08	90.00	AVRG
Trichloroethene	0.3580000	0.3541506	0.3541506	0.001	-1.08	90.00	AVRG
1,2-Dichloropropane	0.4450000	0.4679292	0.4679292	0.001	5.15	20.00	AVRG
Bromodichloromethane	0.5840000	0.6659700	0.6659700	0.001	14.04	90.00	AVRG
cis-1,3-Dichloropropene	0.5040000	0.5239841	0.5239841	0.001	3.96	90.00	AVRG
4-Methyl-2-pentanone	0.2930000	0.2768723	0.2768723	0.001	-5.50	90.00	AVRG
Toluene	0.7950000	0.7959193	0.7959193	0.001	0.12	20.00	AVRG
trans-1,3-Dichloropropene	0.4890000	0.5197976	0.5197976	0.001	6.30	90.00	AVRG
1,1,2-Trichloroethane	0.3820000	0.3778407	0.3778407	0.001	-1.09	90.00	AVRG
Tetrachloroethene	0.4160000	0.4228257	0.4228257	0.001	1.64	90.00	AVRG
2-hexanone	0.2040000	0.1968039	0.1968039	0.001	-3.53	90.00	AVRG
Dibromochloromethane	0.6600000	0.6847206	0.6847206	0.001	3.74	90.00	AVRG
1,2-Dibromoethane	0.5340000	0.5336555	0.5336555	0.001	-0.06	90.00	AVRG
Chlorobenzene	0.9770000	0.9831040	0.9831040	0.3	0.62	90.00	AVRG
Ethylbenzene	0.4760000	0.4765835	0.4765835	0.001	0.12	20.00	AVRG
Styrene	0.8820000	0.9321313	0.9321313	0.001	5.68	90.00	AVRG
Bromoform	0.4170000	0.3972497	0.3972497	0.1	-4.74	90.00	AVRG
Isopropyl Benzene	1.5400000	1.6369824	1.6369824	0.001	6.30	90.00	AVRG
1,1,2,2-Tetrachloroethane	1.3620000	1.3736309	1.3736309	0.3	0.85	90.00	AVRG
1,3-Dichlorobenzene	1.4900000	1.5884027	1.5884027	0.001	6.60	90.00	AVRG
1,4-Dichlorobenzene	1.6500000	1.6240451	1.6240451	0.001	-1.57	90.00	AVRG
1,2-Dichlorobenzene	1.3120000	1.2855395	1.2855395	0.001	-2.02	90.00	AVRG

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: F50052 Calibration Date: 12/03/02 Time: 1100

Lab File ID: CS021203A52 Init. Calib. Date(s): 11/12/02 11/12/02

Init. Calib. Times: 0757 1102

GC Column: EQUITY624 ID: 0.53 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dibromo-3-Chloropropane	0.2050000	0.1719466	0.1719466	0.001	-16.12	90.00	AVRG
1,2,4-Trichlorobenzene	0.7740000	0.6747680	0.6747680	0.001	-12.82	90.00	AVRG
Xylene (total)	0.5750000	0.6042761	0.6042761	0.001	5.09	90.00	AVRG
Methyl acetate	0.2600000	0.2050871	0.2050871	0.001	-21.12	90.00	AVRG
Cyclohexane	0.5620000	0.5295926	0.5295926	0.001	-5.77	90.00	AVRG
Methylcyclohexane	0.5140000	0.5196910	0.5196910	0.001	1.11	90.00	AVRG
Dibromofluoromethane	0.6370000	0.6008943	0.6008943	0.001	-5.67	90.00	AVRG
1,2-Dichloroethane-d4	0.2630000	0.2623331	0.2623331	0.001	-0.25	90.00	AVRG
Toluene-d8	1.2490000	1.1661670	1.1661670	0.001	-6.63	90.00	AVRG
Bromofluorobenzene	1.8100000	1.5223094	1.5223094	0.001	-15.89	90.00	AVRG

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Level: (low/med) LOW

	CLIENT SAMPLE NO.	SMC1 (DBF) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	VBLKVT	106	102	114	112	0
02	VTLLCS	76	81	78	76	0
03	40SB5A	358*	338*	248*	248*	4
04	40SB5F	382*	376*	270*	248*	4
05	40SB5C	367*	354*	252*	222*	4
06	40SB4A	342*	333*	240*	220*	4
07	40SB4F	393*	388*	324*	325*	4
08	40SB1B	99	110	99	110	0
09	40SB1C	98	105	100	106	0
10	40SB2A	93	106	98	108	0
11	40SB2F	116	131	119	127	0
12	40SB2B	92	104	92	100	0
13	40SB2C	102	114	104	112	0
14	VBLKVX	109	99	105	101	0
15	VVXLCS	106	98	111	101	0
16	D-5	88	86	96	105	0
17	71SB11B	89	88	91	90	0
18	71SB11C	94	88	92	89	0
19	TESTPIT2F	91	82	104	114	0
20	TESTPIT2FMS	78	69*	92	93	1
21	TESTPIT2FMSD	82	72	96	93	0
22	TESTPIT2BP	86	82	86	78	0
23	40SB1F	96	92	95	94	0
24	71SS13	95	92	106	114	0
25	71SB11F	84	80	87	87	0
26	40SB2FRE	109	104	114	113	0
27	40SB1A	101	97	100	103	0
28	VBLKVY	113	92	123	114	0

		QC LIMITS
SMC1 (DBF)	= Dibromofluoromethane	(71-141)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(70-139)
SMC3 (TOL)	= Toluene-d8	(72-123)
SMC4 (BFB)	= Bromofluorobenzene	(65-131)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 3

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix Spike - Sample No.: TESTPIT2F Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	84	0.00	56	67	50-150
Chloromethane	84	0.00	59	70	50-150
Vinyl Chloride	84	0.00	56	67	50-150
Bromomethane	84	0.00	17	20*	50-150
Chloroethane	84	0.00	82	98	50-150
Trichlorofluoromethane	84	0.00	62	74	50-150
1,1-Dichloroethene	84	0.00	67	80	50-150
Carbon disulfide	84	3.1	48	53	50-150
1,1,2-trichloro-1,2,2-t	84	0.00	75	89	50-150
Acetone	210	57	290	110	50-150
Methylene Chloride	84	0.00	73	87	50-150
trans-1,2-Dichloroethen	84	0.00	60	71	50-150
Methyl-tert-butyl ether	84	0.00	90	110	50-150
1,1-Dichloroethane	84	4.8	72	80	50-150
cis-1,2-Dichloroethene	84	0.00	72	86	50-150
2-butanone	210	0.00	260	120	50-150
Chloroform	84	0.00	69	82	50-150
1,1,1-Trichloroethane	84	0.00	71	85	50-150
Carbon Tetrachloride	84	0.00	68	81	50-150
Benzene	84	8.5	76	80	50-150
1,2-Dichloroethane	84	0.00	66	79	50-150
Trichloroethene	84	0.00	70	83	50-150
1,2-Dichloropropane	84	0.00	79	94	50-150
Bromodichloromethane	84	0.00	69	82	50-150
cis-1,3-Dichloropropene	84	0.00	68	81	50-150
4-Methyl-2-pentanone	210	0.00	300	140	50-150
Toluene	84	7.6	69	73	50-150
trans-1,3-Dichloroprope	84	0.00	70	83	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix Spike - Sample No.: TESTPIT2F Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
1,1,2-Trichloroethane	84	0.00	97	120	50-150
Tetrachloroethene	84	0.00	76	90	50-150
2-hexanone	210	0.00	290	140	50-150
Dibromochloromethane	84	0.00	87	100	50-150
1,2-Dibromoethane	84	0.00	91	110	50-150
Chlorobenzene	84	0.00	79	94	50-150
Ethylbenzene	84	1.9	80	93	50-150
Styrene	84	0.00	76	90	50-150
Bromoform	84	0.00	87	100	50-150
Isopropyl Benzene	84	0.00	71	85	50-150
1,1,2,2-Tetrachloroetha	84	0.00	130	150	50-150
1,3-Dichlorobenzene	84	0.00	82	98	50-150
1,4-Dichlorobenzene	84	0.00	82	98	50-150
1,2-Dichlorobenzene	84	0.00	88	100	50-150
1,2-Dibromo-3-Chloropro	84	0.00	150	180*	50-150
1,2,4-Trichlorobenzene	84	0.00	58	69	50-150
Xylene (total)	250	10	240	92	50-150
Methyl acetate	84	0.00	83	99	50-150
Cyclohexane	84	0.00	69	82	50-150
Methylcyclohexane	84	0.00	58	69	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix Spike - Sample No.: TESTPIT2F Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	100	74	74	28	40	50-150
Chloromethane	100	72	72	20	40	50-150
Vinyl Chloride	100	76	76	30	40	50-150
Bromomethane	100	19	19*	11	40	50-150
Chloroethane	100	52	52	45*	40	50-150
Trichlorofluoromethane	100	81	81	26	40	50-150
1,1-Dichloroethene	100	70	70	4	40	50-150
Carbon disulfide	100	34	31*	34	40	50-150
1,1,2-trichloro-1,2,2-t	100	80	80	6	40	50-150
Acetone	250	420	150	37	40	50-150
Methylene Chloride	100	82	82	12	40	50-150
trans-1,2-Dichloroethen	100	54	54	10	40	50-150
Methyl-tert-butyl ether	100	110	110	20	40	50-150
1,1-Dichloroethane	100	84	79	15	40	50-150
cis-1,2-Dichloroethene	100	75	75	4	40	50-150
2-butanone	250	380	150	38	40	50-150
Chloroform	100	78	78	12	40	50-150
1,1,1-Trichloroethane	100	79	79	11	40	50-150
Carbon Tetrachloride	100	74	74	8	40	50-150
Benzene	100	84	75	10	40	50-150
1,2-Dichloroethane	100	77	77	15	40	50-150
Trichloroethene	100	67	67	4	40	50-150
1,2-Dichloropropane	100	92	92	15	40	50-150
Bromodichloromethane	100	79	79	14	40	50-150
cis-1,3-Dichloropropene	100	68	68	0	40	50-150
4-Methyl-2-pentanone	250	450	180*	40	40	50-150
Toluene	100	74	66	7	40	50-150
trans-1,3-Dichloroprope	100	68	68	3	40	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix Spike - Sample No.: TESTPIT2F Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1,2-Trichloroethane	100	120	120	21	40	50-150
Tetrachloroethene	100	73	73	4	40	50-150
2-hexanone	250	420	170*	37	40	50-150
Dibromochloromethane	100	97	97	11	40	50-150
1,2-Dibromoethane	100	110	110	19	40	50-150
Chlorobenzene	100	80	80	1	40	50-150
Ethylbenzene	100	80	78	0	40	50-150
Styrene	100	74	74	3	40	50-150
Bromoform	100	92	92	6	40	50-150
Isopropyl Benzene	100	66	66	7	40	50-150
1,1,2,2-Tetrachloroetha	100	160	160*	21	40	50-150
1,3-Dichlorobenzene	100	74	74	10	40	50-150
1,4-Dichlorobenzene	100	73	73	12	40	50-150
1,2-Dichlorobenzene	100	84	84	5	40	50-150
1,2-Dibromo-3-Chloropro	100	190	190*	24	40	50-150
1,2,4-Trichlorobenzene	100	50	50	15	40	50-150
Xylene (total)	300	230	73	4	40	50-150
Methyl acetate	100	110	110	28	40	50-150
Cyclohexane	100	66	66	4	40	50-150
Methylcyclohexane	100	50	50	15	40	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 1 out of 48 outside limits
Spike Recovery: 8 out of 96 outside limits

COMMENTS: _____

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID (Standard): CU021128B59 Date Analyzed: 11/28/02

Instrument ID: 5972HP59 Time Analyzed: 1603

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	588967	8.99	344591	12.47	180922	14.47
	UPPER LIMIT	1177934	9.49	689182	12.97	361844	14.97
	LOWER LIMIT	294484	8.49	172296	11.97	90461	13.97
	CLIENT SAMPLE NO.						
01	VBLKVT	-68 727713	8.98	410150	12.46	187354	14.47
02	VTLLCS	693528	8.98	414715	12.46	206825	14.46
03	~~40SB5A~~	-71 190168*	8.98	-52 163627*	12.46	-65 63124*	14.46
04	~~40SB5F~~	-71 169283*	8.98	-58 143534*	12.47	-62 67248*	14.46
05	~~40SB5C~~	-68 186626*	8.99	-52 164997*	12.47	-52 86174*	14.47
06	~~40SB4A~~	-71 170206*	8.98	-56 151134*	12.47	-60 71527*	14.47
07	~~40SB4F~~	-83 96895*	8.98	-83 57683*	12.46	-91 14965*	14.47
08	40SB1B	602237	8.98	331001	12.47	124821	14.47
09	40SB1C	686706	8.98	400029	12.46	171781	14.47
10	40SB2A	642370	8.98	339738	12.46	127109	14.47
11	~~40SB2F~~	430386	8.99	-51 169740*	12.48	-75 45487*	14.47
12	40SB2B	565570	8.99	324168	12.47	135291	14.47
13	40SB2C	530358	8.99	302198	12.47	124347	14.47
14							
15							
16							
17							
18							
19							
20							

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM VIII VOA

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID (Standard): GS021129A59 Date Analyzed: 11/29/02

Instrument ID: 5972HP59 Time Analyzed: 1124

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	712218	8.99	444075	12.47	224931	14.47
	UPPER LIMIT	1424436	9.49	888150	12.97	449862	14.97
	LOWER LIMIT	356109	8.49	222038	11.97	112466	13.97
	CLIENT SAMPLE NO.						
01	VBLKVX	611934	8.99	374266	12.48	181657	14.48
02	VVXLCS	740874	8.99	457280	12.47	236860	14.47
03	D-5	666810	9.00	342200	12.49	118899	14.48
04	71SB11B	822043	9.00	479946	12.48	210474	14.48
05	71SB11C	907253	9.00	545736	12.48	254921	14.48
06	TESTPIT2F	726991	9.00	342579	12.48	3105145*	14.48
07	TESTPIT2FMS	866618	9.00	450579	12.48	168134	14.47
08	TESTPIT2FMSD	902210	9.00	460179	12.48	173279	14.48
09	TESTPIT2BP	866214	9.00	531108	12.48	277805	14.48
10	40SB1F	904141	9.00	512000	12.49	222580	14.48
11	71SS13	735335	8.99	354303	12.48	120721	14.48
12	71SB11F	842683	9.00	468242	12.49	191848	14.48
13	40SB2FRE	662691	9.00	280534	12.49	6285829*	14.48
14	40SB1A	687582	9.00	324682	12.49	116350	14.48
15							
16							
17							
18							
19							
20							

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID (Standard): GT021202A59 Date Analyzed: 12/02/02

Instrument ID: 5972HP59 Time Analyzed: 1217

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	910396	8.99	559010	12.48	277501	14.47
	UPPER LIMIT	1820792	9.49	1118020	12.98	555002	14.97
	LOWER LIMIT	455198	8.49	279505	11.98	138750	13.97
	CLIENT SAMPLE NO.						
01	VBLKVY	882095	8.99	522902	12.47	254462	14.47
02	VVYLCS	891780	8.99	528224	12.47	263385	14.47
03	40SB5FRE	790462	9.00	411394	12.48	164351	14.47
04	40SB5CRE	801004	8.99	442780	12.48	181466	14.47
05	40SB4ARE	922166	8.99	521960	12.48	203764	14.47
06	40SB5ARE	1015567	8.99	610133	12.47	280702	14.47
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID (Standard): CS021203A52 Date Analyzed: 12/03/02

Instrument ID: F50052 Time Analyzed: 1100

GC Column: EQUITY624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	1439769	10.63	1165544	13.92	607142	15.77
	UPPER LIMIT	2879538	11.13	2331088	14.42	1214284	16.27
	LOWER LIMIT	719884	10.13	582772	13.42	303571	15.27
	CLIENT SAMPLE NO.						
01	VBLKVU	1395504	10.62	1183163	13.92	535725	15.76
02	VULCS	1328186	10.62	1131088	13.92	596779	15.76
03	40SB4FRE	997395	10.63	848964	13.94	404913	15.77
04							
05							
06							
07							
08							
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16							
17							
18							
19							
20							

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

15295137.10000

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 1/14/03
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: ~~15291537.~~10000
Laboratory: Compuchem
SDG No.: T2788
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	✓	✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

	collected	extracted	analyzed	
11/18/02	11/15/02	11/25/02	12/9/02	11/30/02
	11/14/02	"	11/30/02	
	11/20/02	11/22/02	11/29/02	11/30/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes: EQB-1 Caprolactam 21 ug/L
EQB-2 " 22 " in SDG R2758

NO POS, no flags

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes: IC 11/25/02 POS J/R atrazine ND UJ/R >50%
CC 11/29/02 atrazine -58.29 all prev ✓ flagged
CC 12/9/02 2-methylnaphtalene -20.57) J/UJ/C
Hexachlorobenzene -20.01)
atrazine -54.31 all prev.

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

	1 or more <10%	2 or 3 high/low	2 or 3 all low	2 or 3 all high
Positives	L	J	L	K
Non-detects	R	UJ	UL	NONE

Note: The B qualifier remains over surrogate flagging.

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached %RPDs out for several. MS/MSD OK, no action.

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		✓	✓

Notes: see attached 405B1F, D-5

bis(2-ethylhexyl)phthalate results outside QC

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			✓

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness =_____			

Notes:

405BIF		RL	D-5	RPD
2,4-DNT	41	600	450U	OKV
n-nitroso—	390		390	OK ✓
Phenanthrene	55	450	42	OKV
di-n-butylph—	720	450	50	670 < 4xRL OKV
bis(2ethyl)—	4200	450	1000	3200 > 1800

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-3RA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	21	
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2788-4RA64

Level: (low/med) LOW Date Received: 11/13/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	22	
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: 5972HP64 Calibration Date(s): 11/25/02 11/25/02

Column: RTX-5MS ID: 0.32 (mm) Calibration Time(s): 2041 2337

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Benzaldehyde	AVRG	1.13360798	18.776	50.000
Phenol	AVRG	1.61419381	10.437	30.000
Bis(2-chloroethyl)ether	AVRG	1.42279476	5.394	50.000
2-Chlorophenol	AVRG	1.32017786	5.673	50.000
2-Methylphenol	AVRG	1.35086999	10.127	50.000
2,2'-oxybis(1-Chloropropane)	AVRG	1.80136619	12.147	50.000
Acetophenone	AVRG	2.11766249	6.745	50.000
4-Methylphenol	AVRG	1.25831343	7.448	50.000
N-Nitroso-di-N-propylamine	AVRG	0.98072155	14.875	50.000
Hexachloroethane	AVRG	0.69301907	8.122	50.000
Nitrobenzene	AVRG	0.46992312	7.948	50.000
Isophorone	AVRG	0.80071477	4.460	50.000
2-Nitrophenol	AVRG	0.23220109	11.639	30.000
2,4-Dimethylphenol	AVRG	0.30596015	17.405	50.000
Bis(2-chloroethoxy)methane	AVRG	0.48218882	3.944	50.000
2,4-Dichlorophenol	AVRG	0.33477862	7.280	30.000
Naphthalene	AVRG	1.07954606	6.261	50.000
4-Chloroaniline	AVRG	0.49471199	5.176	50.000
Hexachlorobutadiene	AVRG	0.28158775	10.441	30.000
Caprolactam	AVRG	0.13579129	5.560	50.000
4-Chloro-3-methylphenol	AVRG	0.35560183	7.474	30.000
2-Methylnaphthalene	AVRG	0.79120021	11.071	50.000
Hexachlorocyclopentadiene	AVRG	0.44372014	17.611	50.000
2,4,6-Trichlorophenol	AVRG	0.44394950	10.060	30.000
2,4,5-Trichlorophenol	AVRG	0.50353440	12.902	50.000
1,1'-Biphenyl	AVRG	1.35796936	13.136	50.000
2-Chloronaphthalene	AVRG	0.99563885	11.264	50.000
2-Nitroaniline	AVRG	0.47461553	11.023	50.000
Dimethylphthalate	AVRG	1.40972693	14.700	50.000
2,6-Dinitrotoluene	AVRG	0.33539014	8.229	50.000
Acenaphthylene	AVRG	1.73675078	12.676	50.000
3-Nitroaniline	AVRG	0.34294245	8.665	50.000
Acenaphthene	AVRG	1.03570200	13.301	30.000
2,4-Dinitrophenol	AVRG	0.21159915	12.847	50.000
4-Nitrophenol	AVRG	0.31841348	14.689	50.000
2,4-Dinitrotoluene	AVRG	0.45746846	9.658	50.000
Dibenzofuran	AVRG	1.72116431	14.031	50.000
Diethylphthalate	AVRG	1.43888496	8.264	50.000
4-Chlorophenyl-phenylether	AVRG	0.68523536	18.722	50.000
Fluorene	AVRG	1.28222397	12.940	50.000
4-Nitroaniline	AVRG	0.35790926	13.788	50.000
4,6-Dinitro-2-methylphenol	AVRG	0.18420774	12.173	50.000
N-Nitrosodiphenylamine	AVRG	0.53755439	15.842	30.000
4-Bromophenyl-phenylether	AVRG	0.28145110	6.424	50.000

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: 5972HP64 Calibration Date(s): 11/25/02 11/25/02

Column: RTX-5MS ID: 0.32 (mm) Calibration Time(s): 2041 2337

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Hexachlorobenzene	AVRG	0.33354824	5.544	50.000
Atrazine	AVRG	0.13583776	69.746	50.000
Pentachlorophenol	AVRG	0.19474831	8.878	30.000
Phenanthrene	AVRG	1.17623288	7.801	50.000
Anthracene	AVRG	1.16871125	7.327	50.000
Carbazole	AVRG	1.04779295	9.078	50.000
Di-n-butylphthalate	AVRG	1.47285411	7.421	50.000
Fluoranthene	AVRG	1.34664335	6.073	30.000
Pyrene	AVRG	1.38506027	5.285	50.000
Butylbenzylphthalate	AVRG	0.68635712	5.722	50.000
3,3'-Dichlorobenzidine	AVRG	0.44742820	6.631	50.000
bis(2-ethylhexyl)Phthalate	AVRG	0.88166660	4.730	50.000
Benzo(a)anthracene	AVRG	1.29223432	4.680	50.000
Chrysene	AVRG	1.12418713	6.775	50.000
Di-n-octylphthalate	AVRG	2.12802595	3.080	30.000
Benzo(b)fluoranthene	AVRG	1.79263450	12.079	50.000
Benzo(k)fluoranthene	AVRG	1.73055574	14.984	50.000
Benzo(a)pyrene	AVRG	1.53613181	5.206	30.000
Indeno(1,2,3-cd)pyrene	AVRG	1.48389065	5.533	50.000
Dibenzo(a,h)anthracene	AVRG	1.40714919	4.582	50.000
Benzo(g,h,i)perylene	AVRG	1.42625822	6.157	50.000
2-Fluorophenol	AVRG	1.58282738	3.090	50.000
Phenol-d5	AVRG	1.81419241	7.581	50.000
Nitrobenzene-d5	AVRG	0.54448082	4.139	50.000
2-Fluorobiphenyl	AVRG	1.37030959	10.437	50.000
2,4,6-Tribromophenol	AVRG	0.37860091	8.911	50.000
Terphenyl-d14	AVRG	1.04946645	3.715	50.000

Average %RSD test result.

Calculate Average %RSD: 9.967387199
Maximum Average %RSD: 15.00000000

Note: Passes Average %RSD Test.

FORM VI SV

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID: DF021129B64 DFTPP Injection Date: 11/29/02

Instrument ID: 5972HP64 DFTPP Injection Time: 2107

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	40.3
68	Less than 2.0% of mass 69	0.1 (0.1)1
69	Mass 69 relative abundance	52.8
70	Less than 2.0% of mass 69	0.4 (0.8)1
127	25.0 - 75.0% of mass 198	37.1
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.7
275	10.0 - 30.0% of mass 198	21.5
365	Greater than 0.75% of mass 198	3.15
441	Present, but less than mass 443	14.1
442	40.0 - 110.0% of mass 198	98.1
443	15.0 - 24.0% of mass 442	18.4 (18.7)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD080	SSTD080	HG021129B64	11/29/02	2129
02	TESTPIT2FMS	WG21554-3	WG21554-3B64	11/29/02	2241
03	TESTPIT2FMSD	WG21554-4	WG21554-4B64	11/29/02	2316
04	TESTPIT2BP	T2788-20	T2788-20B64	11/29/02	2351
05	TESTPIT2F	T2788-19	T2788-19JB64	11/30/02	0026
06	SBLKYG	WG21649-1	WG21649-1B64	11/30/02	0504
07	SYGLCS	WG21649-2	WG21649-2B64	11/30/02	0539
08	40SB5A	T2788-1	T2788-1RB64	11/30/02	0614
09	40SB5F	T2788-2	T2788-2RB64	11/30/02	0649
10	40SB5C	T2788-3	T2788-3RB64	11/30/02	0723
11	40SB4A	T2788-4	T2788-4RB64	11/30/02	0758
12	40SB1B	T2788-6	T2788-6RB64	11/30/02	0907
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FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: 5972HP64 Calibration Date: 11/29/02 Time: 2129

Lab File ID: HG021129B64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
N-Nitrosodiphenylamine	0.5380000	0.5362532	0.01	-0.32	20.00	AVRG	
4-Bromophenyl-phenylether	0.2810000	0.2896092	0.01	3.06	50.00	AVRG	
Hexachlorobenzene	0.3340000	0.3456056	0.01	3.47	50.00	AVRG	
Atrazine	0.1360000	0.0567297	0.01	-58.29	50.00	AVRG	<-
Pentachlorophenol	0.1940000	0.1904098	0.05	-1.85	20.00	AVRG	
Phenanthrene	1.1760000	1.1338179	0.01	-3.59	50.00	AVRG	
Anthracene	1.1690000	1.1626193	0.01	-0.54	50.00	AVRG	
Carbazole	1.0480000	1.0431003	0.01	-0.47	50.00	AVRG	
Di-n-butylphthalate	1.4730000	1.4236902	0.01	-3.35	50.00	AVRG	
Fluoranthene	1.3470000	1.3451662	0.01	-0.14	20.00	AVRG	
Pyrene	1.3850000	1.4222197	0.01	2.69	50.00	AVRG	
Butylbenzylphthalate	0.6860000	0.6898831	0.01	0.57	50.00	AVRG	
3,3'-Dichlorobenzidine	0.4470000	0.4518917	0.01	1.09	50.00	AVRG	
bis(2-ethylhexyl)Phthalate	0.8820000	0.8350465	0.01	-5.32	50.00	AVRG	
Benzo(a)anthracene	1.2920000	1.3028655	0.01	0.84	50.00	AVRG	
Chrysene	1.1240000	1.1715618	0.01	4.23	50.00	AVRG	
Di-n-octylphthalate	2.1280000	2.0355187	0.01	-4.34	20.00	AVRG	
Benzo(b)fluoranthene	1.7930000	1.8868480	0.01	5.23	50.00	AVRG	
Benzo(k)fluoranthene	1.7300000	1.7892125	0.01	3.42	50.00	AVRG	
Benzo(a)pyrene	1.5360000	1.5843385	0.01	3.15	20.00	AVRG	
Indeno(1,2,3-cd)pyrene	1.4840000	1.5100204	0.01	1.75	50.00	AVRG	
Dibenzo(a,h)anthracene	1.4070000	1.3459153	0.01	-4.34	50.00	AVRG	
Benzo(g,h,i)perylene	1.4260000	1.3317599	0.01	-6.61	50.00	AVRG	
2-Fluorophenol	1.5830000	1.5839030	0.01	0.06	50.00	AVRG	
Phenol-d5	1.8140000	1.7633580	0.01	-2.79	50.00	AVRG	
Nitrobenzene-d5	0.5440000	0.5150717	0.01	-5.32	50.00	AVRG	
2-Fluorobiphenyl	1.3700000	1.5090908	0.01	10.15	50.00	AVRG	
2,4,6-Tribromophenol	0.3780000	0.3735916	0.01	-1.17	50.00	AVRG	
Terphenyl-d14	1.0500000	1.0932764	0.01	4.12	50.00	AVRG	

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Lab File ID: DF021209A64 DFTPP Injection Date: 12/09/02

Instrument ID: 5972HP64 DFTPP Injection Time: 1149

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	55.9
68	Less than 2.0% of mass 69	0.7 (1.0)1
69	Mass 69 relative abundance	76.3
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	25.0 - 75.0% of mass 198	49.4
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.0
275	10.0 - 30.0% of mass 198	18.8
365	Greater than 0.75% of mass 198	2.63
441	Present, but less than mass 443	11.3
442	40.0 - 110.0% of mass 198	80.9
443	15.0 - 24.0% of mass 442	15.1 (18.7)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD080	SSTD080	HG021209A64	12/09/02	1330
02	40SB1C	T2788-7	T2788-7RA64	12/09/02	1407
03	40SB2A	T2788-8	T2788-8RA64	12/09/02	1447
04	40SB2F	T2788-9	T2788-9RA64	12/09/02	1522
05	40SB2B	T2788-10	T2788-10RA64	12/09/02	1557
06	40SB2C	T2788-11	T2788-11RA64	12/09/02	1631
07	40SB1A	T2788-12	T2788-12RA64	12/09/02	1706
08	40SB1F	T2788-13	T2788-13RA64	12/09/02	1741
09	D-5	T2788-14	T2788-14RA64	12/09/02	1816
10	71SS13	T2788-15	T2788-15RA64	12/09/02	1850
11	71SB11F	T2788-16	T2788-16RA64	12/09/02	1925
12	71SB11B	T2788-17	T2788-17RA64	12/09/02	2000
13	71SB11C	T2788-18	T2788-18RA64	12/09/02	2035
14	40SB4F	T2788-5	T2788-5RJ2A64	12/09/02	2205
15					
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FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: 5972HP64 Calibration Date: 12/09/02 Time: 1330

Lab File ID: HG021209A64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Benzaldehyde	1.1340000	1.1416056	0.01	0.67	50.00	AVRG
Phenol	1.6140000	1.7351226	0.01	7.50	20.00	AVRG
Bis(2-chloroethyl)ether	1.4220000	1.6173151	0.01	13.74	50.00	AVRG
2-Chlorophenol	1.3200000	1.3618076	0.01	3.17	50.00	AVRG
2-Methylphenol	1.3510000	1.3128842	0.01	-2.82	50.00	AVRG
2,2'-oxybis(1-Chloropropane)	1.8010000	2.0785115	0.01	15.41	50.00	AVRG
Acetophenone	2.1180000	2.1090375	0.01	-0.42	50.00	AVRG
4-Methylphenol	1.2580000	1.2322730	0.01	-2.04	50.00	AVRG
N-Nitroso-di-N-propylamine	0.9810000	0.9390647	0.05	-4.27	50.00	AVRG
Hexachloroethane	0.6930000	0.7020394	0.01	1.30	50.00	AVRG
Nitrobenzene	0.4700000	0.4263151	0.01	-9.29	50.00	AVRG
Isophorone	0.8010000	0.8796190	0.01	9.82	50.00	AVRG
2-Nitrophenol	0.2320000	0.2122573	0.01	-8.51	20.00	AVRG
2,4-Dimethylphenol	0.3060000	0.2924852	0.01	-4.42	50.00	AVRG
Bis(2-chloroethoxy)methane	0.4820000	0.4365248	0.01	-9.43	50.00	AVRG
2,4-Dichlorophenol	0.3350000	0.2843232	0.01	-15.13	20.00	AVRG
Naphthalene	1.0790000	0.8934228	0.01	-17.20	50.00	AVRG
4-Chloroaniline	0.4940000	0.4445712	0.01	-10.00	50.00	AVRG
Hexachlorobutadiene	0.2810000	0.2624814	0.01	-6.59	20.00	AVRG
Caprolactam	0.1360000	0.1177041	0.01	-13.45	50.00	AVRG
4-Chloro-3-methylphenol	0.3560000	0.3110640	0.01	-12.62	20.00	AVRG
2-Methylnaphthalene	0.7910000	0.6283167	0.01	-20.57	50.00	AVRG
Hexachlorocyclopentadiene	0.4440000	0.3705005	0.05	-16.55	50.00	AVRG
2,4,6-Trichlorophenol	0.4440000	0.4515367	0.01	1.70	20.00	AVRG
2,4,5-Trichlorophenol	0.5040000	0.5464197	0.01	8.42	50.00	AVRG
1,1'-Biphenyl	1.3580000	1.5495223	0.01	14.10	50.00	AVRG
2-Chloronaphthalene	0.9960000	1.0782488	0.01	8.26	50.00	AVRG
2-Nitroaniline	0.4740000	0.5238550	0.01	10.52	50.00	AVRG
Dimethylphthalate	1.4100000	1.6225919	0.01	15.08	50.00	AVRG
2,6-Dinitrotoluene	0.3350000	0.2760589	0.01	-17.59	50.00	AVRG
Acenaphthylene	1.7360000	1.9309627	0.01	11.23	50.00	AVRG
3-Nitroaniline	0.3430000	0.3965397	0.01	15.61	50.00	AVRG
Acenaphthene	1.0360000	0.9050591	0.01	-12.64	20.00	AVRG
2,4-Dinitrophenol	0.2120000	0.2137369	0.05	0.82	50.00	AVRG
4-Nitrophenol	0.3180000	0.3404735	0.05	7.07	50.00	AVRG
2,4-Dinitrotoluene	0.4570000	0.3813754	0.01	-16.55	50.00	AVRG
Dibenzofuran	1.7210000	1.7749693	0.01	3.14	50.00	AVRG
Diethylphthalate	1.4390000	1.5679727	0.01	8.96	50.00	AVRG
4-Chlorophenyl-phenylether	0.6850000	0.5956566	0.01	-13.04	50.00	AVRG
Fluorene	1.2820000	1.3430392	0.01	4.76	50.00	AVRG
4-Nitroaniline	0.3580000	0.4083083	0.01	14.05	50.00	AVRG
4,6-Dinitro-2-methylphenol	0.1840000	0.1691767	0.01	-8.06	50.00	AVRG

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: 5972HP64 Calibration Date: 12/09/02 Time: 1330

Lab File ID: HG021209A64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
N-Nitrosodiphenylamine	0.5380000	0.5895224	0.01	9.58	20.00	AVRG	
4-Bromophenyl-phenylether	0.2810000	0.2254154	0.01	-19.78	50.00	AVRG	
Hexachlorobenzene ✓	0.3340000	0.2671529	0.01	-20.01	50.00	AVRG	
Atrazine	0.1360000	0.0621435	0.01	-54.31	50.00	AVRG	<-
Pentachlorophenol	0.1940000	0.1569999	0.05	-19.07	20.00	AVRG	
Phenanthrene	1.1760000	0.9568206	0.01	-18.64	50.00	AVRG	
Anthracene	1.1690000	0.9457253	0.01	-19.10	50.00	AVRG	
Carbazole	1.0480000	0.8557424	0.01	-18.34	50.00	AVRG	
Di-n-butylphthalate	1.4730000	1.4687732	0.01	-0.29	50.00	AVRG	
Fluoranthene	1.3470000	1.2060090	0.01	-10.47	20.00	AVRG	
Pyrene	1.3850000	1.4160474	0.01	2.24	50.00	AVRG	
Butylbenzylphthalate	0.6860000	0.8074176	0.01	17.70	50.00	AVRG	
3,3'-Dichlorobenzidine	0.4470000	0.4353776	0.01	-2.60	50.00	AVRG	
bis(2-ethylhexyl)Phthalate	0.8820000	1.0100109	0.01	14.51	50.00	AVRG	
Benzo(a)anthracene	1.2920000	1.3589967	0.01	5.18	50.00	AVRG	
Chrysene	1.1240000	1.1645230	0.01	3.60	50.00	AVRG	
Di-n-octylphthalate	2.1280000	2.5001467	0.01	17.49	20.00	AVRG	
Benzo(b)fluoranthene	1.7930000	2.1220161	0.01	18.35	50.00	AVRG	
Benzo(k)fluoranthene	1.7300000	1.5704034	0.01	-9.22	50.00	AVRG	
Benzo(a)pyrene	1.5360000	1.4708039	0.01	-4.24	20.00	AVRG	
Indeno(1,2,3-cd)pyrene	1.4840000	1.6923482	0.01	14.04	50.00	AVRG	
Dibenzo(a,h)anthracene	1.4070000	1.5381555	0.01	9.32	50.00	AVRG	
Benzo(g,h,i)perylene	1.4260000	1.5117938	0.01	6.02	50.00	AVRG	
2-Fluorophenol	1.5830000	1.5326226	0.01	-3.18	50.00	AVRG	
Phenol-d5	1.8140000	1.9975140	0.01	10.12	50.00	AVRG	
Nitrobenzene-d5	0.5440000	0.5496731	0.01	1.04	50.00	AVRG	
2-Fluorobiphenyl	1.3700000	1.3334185	0.01	-2.67	50.00	AVRG	
2,4,6-Tribromophenol	0.3780000	0.3444016	0.01	-8.89	50.00	AVRG	
Terphenyl-d14	1.0500000	1.0731599	0.01	2.20	50.00	AVRG	

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix Spike - Sample No.: TESTPIT2F Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzaldehyde	3300	2900	88	52*	50	10-101
Phenol	3300	2300	70	9	47	35-121
Bis(2-chloroethyl)ether	3300	2300	70	4	50	22-116
2-Chlorophenol	3300	2200	67	0	43	36-116
2-Methylphenol	3300	1900	58	0	45	40-109
2,2'-oxybis(1-Chloropro	3300	2700	82	8	46	28-106
Acetophenone	3300	2600	79	8	43	22-107
4-Methylphenol	6700	5400	79	6	40	10-150
N-Nitroso-di-N-prop.(1)	3300	2500	76	4	45	33-117
Hexachloroethane	3300	2100	64	0	50	12-115
Nitrobenzene	3300	2300	70	0	43	28-117
Isophorone	3300	2000	61	10	42	31-111
2-Nitrophenol	3300	2200	67	4	48	36-117
2,4-Dimethylphenol	3300	2500	76	4	43	26-133
Bis(2-chloroethoxy)meth	3300	2300	70	0	43	44-125
2,4-Dichlorophenol	3300	2600	79	0	45	41-123
Naphthalene	3300	3000	88	0	37	19-112
4-Chloroaniline	3300	1500	45	45	50	10-100
Hexachlorobutadiene	3300	2100	64	5	46	22-122
Caprolactam	3300	2300	70	0	50	10-150
4-Chloro-3-methylphenol	3300	2100	64	9	45	39-121
2-Methylnaphthalene	3300	3500	94	0	32	20-146
Hexachlorocyclopentadie	3300	1100	33	15	50	10-150
2,4,6-Trichlorophenol	3300	2600	79	0	44	40-137
2,4,5-Trichlorophenol	3300	2500	76	0	43	45-127
1,1'-Biphenyl	3300	3200	95	3	43	30-109
2-Chloronaphthalene	3300	2700	82	0	41	23-131
2-Nitroaniline	3300	3500	110	12	40	22-140

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix Spike - Sample No.: TESTPIT2F Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dimethylphthalate	3300	2700	82	8	45	33-123
2,6-Dinitrotoluene	3300	2400	73	8	42	20-138
Acenaphthylene	3300	2600	79	4	40	29-118
3-Nitroaniline	3300	2800	85	49*	43	17-100
Acenaphthene	3300	2700	82	4	41	20-109
2,4-Dinitrophenol	3300	1200	36	18	50	10-142
4-Nitrophenol	3300	2400	73	4	42	10-150
2,4-Dinitrotoluene	3300	2500	76	4	43	24-128
Dibenzofuran	3300	3200	97	6	35	40-118
Diethylphthalate	3300	2700	78	4	41	32-119
4-Chlorophenyl-phenylet	3300	2700	82	0	42	34-118
Fluorene	3300	3400	100	3	32	23-119
4-Nitroaniline	3300	2500	76	4	45	16-106
4,6-Dinitro-2-methylphe	3300	1600	48	13	50	10-126
N-Nitrosodiphenylamine	3300	4600	34	21	37	31-125
4-Bromophenyl-phenyleth	3300	2800	85	4	45	38-119
Hexachlorobenzene	3300	2400	73	4	44	31-133
Atrazine	3300	4500	140	12	50	10-150
Pentachlorophenol	3300	2400	73	9	50	10-150
Phenanthrene	3300	3100	88	7	50	31-113
Anthracene	3300	2900	88	11	39	29-114
Carbazole	3300	2100	64	5	43	36-131
Di-n-butylphthalate	3300	2600	77	8	50	17-132
Fluoranthene	3300	2800	85	11	50	26-124
Pyrene	3300	3000	90	10	50	13-125
Butylbenzylphthalate	3300	2400	73	9	43	28-118
3,3'-Dichlorobenzidine	3300	1800	55	65*	50	10-106
bis(2-ethylhexyl)Phthal	3300	3200	62	0	50	13-133

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RA
Date: 1/23/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: T2788
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

collected	extracted	analyzed	
11/14/02	11/19/02	12/15/02	12/18/02
11/15/02	11/19/02	12/14/02	12/17/02
11/18/02	11/20/02	12/2/02	12/14/02
11/20/02	11/25/02	12/8/02	12/17/02

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: MB analyzed 12/13/02 pyrene 8.1 ug/kg extracted 11/19/02 EB in SDG R2750 as ND
MB 4 extract 11/25/02 benzo(b)fluoranthene 3.4 ug/kg (5x → B, Z

4.0 Initial and Continuing Calibration

		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	✓	✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: See attached pos J,C

5.0 Surrogate Recovery

		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached LCS OK, comment

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			✓
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		✓	✓

Notes:

	405B1F	D-5	RPD
acenaphthene	440	3400	(154)
fluoranthene	280	310 OKV	
chrysene	3700	3000 OKV	
benzo(b)fluo	98	230 V OKV	
benzo(a)anthracene	320	3700	27
acenaphthylene	320	2000	(144)

comment

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes: see attached - Pos J/g unless prev flagged-

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			
	% Completeness = _____			

Notes:

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKXZ

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21642-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/08/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	42	U
83-32-9	Acenaphthene	42	U
86-73-7	Fluorene	42	U
129-00-0	Pyrene	17	U
85-01-8	Phenanthrene	42	U
120-12-7	Anthracene	42	U
206-44-0	Fluoranthene	17	U
218-01-9	Chrysene	8.3	U
205-99-2	Benzo(b)fluoranthene	3.4	J
207-08-9	Benzo(k)fluoranthene	8.3	U
53-70-3	Dibenzo(a,h)anthracene	8.3	U
191-24-2	Benzo(g,h,i)perylene	8.3	U
56-55-3	Benzo(a)anthracene	8.3	U
50-32-8	Benzo(a)pyrene	8.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	8.3	U
208-96-8	Acenaphthylene	42	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKVV

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21474-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/19/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/01/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	42	U
83-32-9	Acenaphthene	42	U
86-73-7	Fluorene	42	U
129-00-0	Pyrene	8.1	J
85-01-8	Phenanthrene	42	U
120-12-7	Anthracene	42	U
206-44-0	Fluoranthene	17	U
218-01-9	Chrysene	8.3	U
205-99-2	Benzo(b)fluoranthene	8.3	U
207-08-9	Benzo(k)fluoranthene	8.3	U
53-70-3	Dibenzo(a,h)anthracene	8.3	U
191-24-2	Benzo(g,h,i)perylene	8.3	U
56-55-3	Benzo(a)anthracene	8.3	U
50-32-8	Benzo(a)pyrene	8.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	8.3	U
208-96-8	Acenaphthylene	42	U

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN76 Calibration Date: 11/28/02 Time: 0225

Lab File ID: 062UPNA4AG Init. Calib. Date(s): 11/26/02 11/26/02

Init. Calib. Times: 1200 1424

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1363.7250	1537.2640	0.1	12.72	15.00	AVRG	
Acenaphthene	775.78900	902.91200	0.01	16.39	15.00	AVRG	<-
Fluorene	5246.3440	6041.9200	0.01	15.16	15.00	AVRG	<-
Pyrene	5626.4920	6175.9600	0.01	9.76	15.00	AVRG	
Phenanthrene	11854.826	13592.176	0.01	14.66	15.00	AVRG	
Anthracene	19973.544	20849.600	0.01	4.39	15.00	AVRG	
Fluoranthene	3977.5960	4455.1200	0.01	12.00	15.00	AVRG	
Chrysene	13794.464	15428.320	0.01	11.84	15.00	AVRG	
Benzo(b)fluoranthene	9385.2800	10548.400	0.01	12.39	15.00	AVRG	
Benzo(k)fluoranthene	6852.6240	7721.7600	0.01	12.68	15.00	AVRG	
Dibenzo(a,h)anthracene	2652.8320	3030.3200	0.01	14.23	15.00	AVRG	
Benzo(g,h,i)perylene	3323.4400	3828.3200	0.01	15.19	15.00	AVRG	<-
Benzo(a)anthracene	8539.8160	9543.2800	0.01	11.75	15.00	AVRG	
Benzo(a)pyrene	8720.5360	9726.4000	0.01	11.53	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7116.6560	8086.5600	0.01	13.63	15.00	AVRG	
Acenaphthylene	1090.3680	1255.8560	0.01	15.18	15.00	AVRG	<-
p-Terphenyl	4035.6110	4555.8400	0.01	12.89	15.00	AVRG	

all ND

FORM VII 8310

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN76 Calibration Date: 11/28/02 Time: 0937

Lab File ID: 074UPNA4AH Init. Calib. Date(s): 11/26/02 11/26/02

Init. Calib. Times: 1200 1424

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1363.7250	1514.7520	0.1	11.07	15.00	AVRG	
Acenaphthene ✓	775.78900	920.88000	0.01	18.70	15.00	AVRG	<-
Fluorene	5246.3440	5999.6800	0.01	14.36	15.00	AVRG	
Pyrene	5626.4920	6278.9200	0.01	11.60	15.00	AVRG	
Phenanthrene	11854.826	13266.496	0.01	11.91	15.00	AVRG	
Anthracene	19973.544	21433.872	0.01	7.31	15.00	AVRG	
Fluoranthene	3977.5960	4336.7600	0.01	9.03	15.00	AVRG	
Chrysene	13794.464	15704.640	0.01	13.85	15.00	AVRG	
Benzo(b)fluoranthene	9385.2800	10641.520	0.01	13.38	15.00	AVRG	
Benzo(k)fluoranthene	6852.6240	7851.6000	0.01	14.58	15.00	AVRG	
Dibenzo(a,h)anthracene ✓	2652.8320	3056.0800	0.01	15.20	15.00	AVRG	<-
Benzo(g,h,i)perylene ✓	3323.4400	3912.4800	0.01	17.72	15.00	AVRG	<-
Benzo(a)anthracene	8539.8160	9711.6800	0.01	13.72	15.00	AVRG	
Benzo(a)pyrene	8720.5360	9754.4800	0.01	11.86	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7116.6560	8130.2400	0.01	14.24	15.00	AVRG	
Acenaphthylene ✓	1090.3680	1258.2880	0.01	15.40	15.00	AVRG	<-
p-Terphenyl	4035.6110	4542.0160	0.01	12.55	15.00	AVRG	

all ND

FORM VII 8310

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN76 Calibration Date: 12/01/02 Time: 1803

Lab File ID: 009WPNA4AQ Init. Calib. Date(s): 12/01/02 12/01/02

Init. Calib. Times: 1339 1648

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1433.0740	1569.9360	0.1	9.55	15.00	AVRG	
Acenaphthene	829.21400	903.80800	0.01	9.00	15.00	AVRG	
Fluorene	5378.3120	6132.0960	0.01	14.02	15.00	AVRG	
Pyrene	5389.6720	6199.9200	0.01	15.03	15.00	AVRG	<-
Phenanthrene	12312.571	13531.584	0.01	9.90	15.00	AVRG	
Anthracene	20032.056	21130.640	0.01	5.48	15.00	AVRG	
Fluoranthene	4134.7160	4539.0800	0.01	9.78	15.00	AVRG	
Chrysene	14096.704	16063.760	0.01	13.95	15.00	AVRG	
Benzo(b)fluoranthene	9612.3840	10895.280	0.01	13.35	15.00	AVRG	
Benzo(k)fluoranthene	7166.6640	8204.8800	0.01	14.49	15.00	AVRG	
Dibenzo(a,h)anthracene	2872.3600	3350.2400	0.01	16.64	15.00	AVRG	<-
Benzo(g,h,i)perylene	3640.3520	4230.1600	0.01	16.20	15.00	AVRG	<-
Benzo(a)anthracene	8561.6720	10007.120	0.01	16.88	15.00	AVRG	<-
Benzo(a)pyrene	8988.6400	10330.480	0.01	14.93	15.00	AVRG	
Indeno(1,2,3-cd)pyrene	7881.9680	8982.8800	0.01	13.97	15.00	AVRG	
Acenaphthylene	1199.0930	1215.0880	0.01	1.33	15.00	AVRG	
p-Terphenyl	4058.2430	4690.5120	0.01	15.58	15.00	AVRG	<-

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FORM VII 8310

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN76 Calibration Date: 12/02/02 Time: 0114

Lab File ID: 021WPNA4AR Init. Calib. Date(s): 12/01/02 12/01/02

Init. Calib. Times: 1339 1648

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1433.0740	1600.2720	0.1	11.67	15.00	AVRG	
Acenaphthene	829.21400	894.94400	0.01	7.93	15.00	AVRG	
Fluorene	5378.3120	6159.4080	0.01	14.52	15.00	AVRG	
Pyrene	5389.6720	6260.0800	0.01	16.15	15.00	AVRG	<-
Phenanthrene	12312.571	13427.008	0.01	9.05	15.00	AVRG	
Anthracene	20032.056	20980.208	0.01	4.73	15.00	AVRG	
Fluoranthene	4134.7160	4477.4800	0.01	8.29	15.00	AVRG	
Chrysene	14096.704	16249.600	0.01	15.27	15.00	AVRG	<-
Benzo(b)fluoranthene	9612.3840	11132.800	0.01	15.82	15.00	AVRG	<-
Benzo(k)fluoranthene	7166.6640	8440.8000	0.01	17.78	15.00	AVRG	<-
Dibenzo(a,h)anthracene	2872.3600	3183.7600	0.01	10.84	15.00	AVRG	
Benzo(g,h,i)perylene	3640.3520	4189.2800	0.01	15.08	15.00	AVRG	<-
Benzo(a)anthracene	8561.6720	10076.160	0.01	17.69	15.00	AVRG	<-
Benzo(a)pyrene	8988.6400	10759.360	0.01	19.70	15.00	AVRG	<-
Indeno(1,2,3-cd)pyrene	7881.9680	8617.6000	0.01	9.33	15.00	AVRG	
Acenaphthylene	1199.0930	1228.9920	0.01	2.49	15.00	AVRG	
p-Terphenyl	4058.2430	4746.9760	0.01	16.97	15.00	AVRG	<-

pos J, C

FORM VII 8310

FORM 7B
8310 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN76 Calibration Date: 12/02/02 Time: 0750

Lab File ID: 032WPNA4AS Init. Calib. Date(s): 12/01/02 12/01/02

Init. Calib. Times: 1339 1648

GC Column: LC-PAH ID: 4.60 (mm)

COMPOUND	RRF OR AMOUNT	RRF12.500 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Naphthalene	1433.0740	1624.1120	0.1	13.33	15.00	AVRG	
Acenaphthene	829.21400	926.86400	0.01	11.78	15.00	AVRG	
Fluorene	5378.3120	6192.6560	0.01	15.14	15.00	AVRG	<-
Pyrene	5389.6720	6159.3200	0.01	14.28	15.00	AVRG	
Phenanthrene	12312.571	13314.640	0.01	8.14	15.00	AVRG	
Anthracene	20032.056	21170.016	0.01	5.68	15.00	AVRG	
Fluoranthene	4134.7160	4514.2000	0.01	9.18	15.00	AVRG	
Chrysene	14096.704	15963.040	0.01	13.24	15.00	AVRG	
Benzo(b)fluoranthene	9612.3840	10931.520	0.01	13.72	15.00	AVRG	
Benzo(k)fluoranthene	7166.6640	8468.0000	0.01	18.16	15.00	AVRG	<-
Dibenzo(a,h)anthracene	2872.3600	3236.2400	0.01	12.67	15.00	AVRG	
Benzo(g,h,i)perylene	3640.3520	4318.4800	0.01	18.63	15.00	AVRG	<-
Benzo(a)anthracene	8561.6720	9827.2000	0.01	14.78	15.00	AVRG	
Benzo(a)pyrene	8988.6400	11035.920	0.01	22.78	15.00	AVRG	<-
Indeno(1,2,3-cd)pyrene	7881.9680	8871.7600	0.01	12.56	15.00	AVRG	
Acenaphthylene	1199.0930	1211.4240	0.01	1.03	15.00	AVRG	
p-Terphenyl	4058.2430	4628.4000	0.01	14.05	15.00	AVRG	

FORM VII 8310

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix Spike - EPA Sample No.: TESTPIT2F

COMPOUND	SPIKE ADDED (ug/Kg	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Naphthalene	170	0.0	0.0	0*	50-150
Acenaphthene	170	0.0	0.0	0*	50-150
Fluorene	330	0.0	370	112	50-150
Pyrene	83	450	640	229*	50-150
Phenanthrene	170	290	540	147	50-150
Anthracene	170	0.0	160	94	50-150
Fluoranthene	83	400	490	108	50-150
Chrysene	83	2400	3100	843*	50-150
Benzo(b)fluoranthene	42	150	0.0	-357*	50-150
Benzo(k)fluoranthene	42	42	48	14*	50-150
Dibenzo(a,h)anthracene	42	0.0	0.0	0*	50-150
Benzo(g,h,i)perylene	42	0.0	0.0	0*	50-150
Benzo(a)anthracene	42	220	200	-48*	50-150
Benzo(a)pyrene	42	0.0	0.0	0*	50-150
Indeno(1,2,3-cd)pyrene	42	0.0	0.0	0*	50-150
Acenaphthylene	170	820	0.0	-482*	20-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix Spike - EPA Sample No.: TESTPIT2F

COMPOUND	SPIKE ADDED (ug/Kg	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Naphthalene	170	430	253*		20	50-150
Acenaphthene	170	0.0	0*		20	50-150
Fluorene	330	400	121	8	20	50-150
Pyrene	83	620	205*	3	20	50-150
Phenanthrene	170	520	135	4	20	50-150
Anthracene	170	160	94	0	20	50-150
Fluoranthene	83	500	120	2	20	50-150
Chrysene	83	2900	602*	7	20	50-150
Benzo(b)fluoranthene	42	110	-95*		20	50-150
Benzo(k)fluoranthene	42	35	-17*	31*	20	50-150
Dibenzo(a,h)anthracene	42	0.0	0*		20	50-150
Benzo(g,h,i)perylene	42	0.0	0*		20	50-150
Benzo(a)anthracene	42	200	-48*	0	20	50-150
Benzo(a)pyrene	42	89	212*		20	50-150
Indeno(1,2,3-cd)pyrene	42	0.0	0*		20	50-150
Acenaphthylene	170	0.0	-482*		20	20-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 1 out of 16 outside limits
Spike Recovery: 24 out of 32 outside limits

COMMENTS: _____

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB1A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-12 Date(s) Analyzed: 12/13/02 12/15/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	11.61	11.00	12.00	51	
	2	9.60	9.18	10.18	1200	183.7
Pyrene	1	15.65	15.13	16.13	43	
	2	13.87	13.37	14.37	87	67.7
Fluoranthene	1	15.06	14.55	15.55	170	
	2	13.11	12.57	13.57	84	67.7
Chrysene	1	16.96	16.45	17.45	12	
	2	16.97	16.48	17.48	680	193.1
Benzo(b)fluoranthene	1	18.55	18.07	19.07	17	
	2	18.68	18.30	19.30	32	61.2
Benzo(a)anthracene	1	16.96	16.45	17.45	12	
	2	16.29	15.80	16.80	14	15.4
Benzo(a)pyrene	1	19.29	18.82	19.82	25	
	2	20.57	20.20	21.20	35	33.3
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-13 Date(s) Analyzed: 12/13/02 12/15/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	11.74	11.00	12.00	640	
	2	9.89	9.18	10.18	440	37.0
Pyrene	1	15.57	15.13	16.13	220	
	2	13.76	13.37	14.37	370	50.8
Fluoranthene	1	14.97	14.55	15.55	450	
	2	13.01	12.57	13.57	280	46.6
Chrysene	1	16.88	16.45	17.45	20	
	2	16.92	16.48	17.48	3700	197.8
Benzo(b)fluoranthene	1	18.48	18.07	19.07	32	
	2	18.67	18.30	19.30	98	101.5
Benzo(a)anthracene	1	16.88	16.45	17.45	20	
	2	16.41	15.80	16.80	820	190.5
Acenaphthylene	1	12.69	12.23	13.23	38	
	2	8.32	7.87	8.87	320	157.5
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB2A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-8 Date(s) Analyzed: 11/28/02 12/13/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.77	13.30	14.30	20	
	2	15.75	15.13	16.13	6.9	97.4
Fluoranthene	1	13.03	12.50	13.50	8.5	
	2	15.15	14.55	15.55	20	80.7
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB2B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-10 Date(s) Analyzed: 12/13/02 12/15/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Chrysene	1	17.02	16.45	17.45	8.2	
	2	16.88	16.48	17.48	2100	198.4
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB2C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-11 Date(s) Analyzed: 12/13/02 12/15/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	15.74	15.13	16.13	10	
	2	13.77	13.37	14.37	310	187.5
Chrysene	1	17.07	16.45	17.45	4.5	
	2	16.90	16.48	17.48	2000	199.1
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

40SB2F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-9 Date(s) Analyzed: 12/13/02 12/14/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	15.67	15.13	16.13	65	
	2	13.77	13.37	14.37	300	128.8
Fluoranthene	1	15.09	14.55	15.55	150	
	2	13.02	12.57	13.57	79	62.0
Chrysene	1	16.96	16.45	17.45	12	
	2	16.93	16.48	17.48	1900	197.5
Benzo(b)fluoranthene	1	18.55	18.07	19.07	13	
	2	18.72	18.30	19.30	56	124.6
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB4A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-4 Date(s) Analyzed: 12/13/02 12/14/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	15.72	15.13	16.13	7.0	
	2	13.80	13.37	14.37	67	162.2
Benzo(b)fluoranthene	1	18.62	18.07	19.07	2.1	
	2	18.71	18.30	19.30	19	160.2
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-5 Date(s) Analyzed: 12/13/02 12/14/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	15.66	15.13	16.13	140	
	2	13.84	13.37	14.37	280	66.7
Fluoranthene	1	15.04	14.55	15.55	760	
	2	13.07	12.57	13.57	150	134.1
Chrysene	1	16.96	16.45	17.45	21	
	2	16.96	16.48	17.48	2300	196.4
Benzo(b)fluoranthene	1	18.57	18.07	19.07	43	
	2	18.70	18.30	19.30	78	57.8
Benzo(k)fluoranthene	1	18.75	18.22	19.22	9.5	
	2	19.55	19.29	20.29	42	126.2
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB5C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-3 Date(s) Analyzed: 12/13/02 12/14/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	11.06	11.00	12.00	42	
	2	9.61	9.18	10.18	1300	187.5
Pyrene	1	15.64	15.13	16.13	18	
	2	13.86	13.37	14.37	120	147.8
Chrysene	1	17.02	16.45	17.45	3.2	
	2	16.98	16.48	17.48	1500	199.1
Benzo(k)fluoranthene	1	18.84	18.22	19.22	3.7	
	2	19.82	19.29	20.29	24	146.6
Acenaphthylene	1	12.48	12.23	13.23	26	
	2	8.65	7.87	8.87	74	96.0
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A
PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.
40SB5F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-2 Date(s) Analyzed: 12/13/02 12/14/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(m

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	15.53	15.13	16.13	53	
	2	13.84	13.37	14.37	940	178.6
Fluoranthene	1	15.12	14.55	15.55	550	
	2	13.06	12.57	13.57	92	142.7
Chrysene	1	16.84	16.45	17.45	7.7	
	2	17.00	16.48	17.48	2300	198.7
Benzo(b)fluoranthene	1	18.62	18.07	19.07	26	
	2	18.74	18.30	19.30	160	144.1
Acenaphthylene	1	12.84	12.23	13.23	15	
	2	8.57	7.87	8.87	660	191.1
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-16 Date(s) Analyzed: 12/13/02 12/15/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	15.67	15.13	16.13	71	
	2	13.77	13.37	14.37	290	121.3
Fluoranthene	1	15.06	14.55	15.55	300	
	2	12.98	12.57	13.57	130	79.1
Chrysene	1	16.98	16.45	17.45	19	
	2	16.90	16.48	17.48	3200	197.6
Benzo(b)fluoranthene	1	18.60	18.07	19.07	14	
	2	18.66	18.30	19.30	56	120.0
Dibenzo(a,h)anthracene	1	19.79	19.37	20.37	12	
	2	22.00	21.48	22.48	210	178.4
Benzo(a)pyrene	1	19.34	18.82	19.82	21	
	2	20.59	20.20	21.20	120	140.4
Acenaphthylene	1	12.74	12.23	13.23	20	
	2	8.54	7.87	8.87	360	178.9
	1					
	2					

FORM X PEST-1

10A

EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

71SS13

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-15 Date(s) Analyzed: 12/02/02 12/13/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.20	6.59	7.59	29	
	2	10.95	10.00	11.00	120	122.1
Acenaphthene	1	9.62	8.99	9.99	67	
	2	11.37	11.00	12.00	140	70.5
Phenanthrene	1	10.87	10.43	11.43	47	
	2	13.43	13.11	14.11	67	35.1
Fluoranthene	1	12.91	12.54	13.54	82	
	2	15.09	14.55	15.55	70	15.8
Chrysene	1	16.98	16.63	17.63	54	
	2	16.88	16.45	17.45	16	108.6
Benzo(b)fluoranthene	1	18.94	18.50	19.50	11	
	2	18.52	18.07	19.07	15	30.8
Benzo(k)fluoranthene	1	19.96	19.51	20.51	5.8	
	2	18.70	18.22	19.22	17	98.2
Benzo(a)anthracene	1	16.47	15.93	16.93	36	
	2	16.88	16.45	17.45	16	76.9

FORM X PEST-1

10A

EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

71SS13

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-15 Date(s) Analyzed: 12/02/02 12/13/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(a)pyrene	1	20.89	20.44	21.44	15	
	2	19.27	18.82	19.82	20	28.6
Acenaphthylene	1	8.32	7.65	8.65	120	
	2	12.78	12.23	13.23	9.6	170.4
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

10A

EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

D-5

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-14 Date(s) Analyzed: 12/13/02 12/15/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	10.46	10.00	11.00	38	
	2	7.04	6.85	7.85	1600	190.7
Acenaphthene	1	11.42	11.00	12.00	8.6	
	2	9.52	9.18	10.18	3400	199.0
Pyrene	1	15.55	15.13	16.13	300	
	2	13.82	13.37	14.37	350	15.4
Fluoranthene	1	15.16	14.55	15.55	320	
	2	13.04	12.57	13.57	310	3.2
Chrysene	1	16.85	16.45	17.45	36	
	2	16.91	16.48	17.48	3000	195.2
Dibenzo(a,h)anthracene	1	19.91	19.37	20.37	140	
	2	21.93	21.48	22.48	200	35.3
Benzo(a)anthracene	1	16.85	16.45	17.45	36	
	2	16.41	15.80	16.80	3700	196.1
Acenaphthylene	1	12.68	12.23	13.23	35	
	2	8.63	7.87	8.87	2000	193.1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

TESTPIT2F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-19 Date(s) Analyzed: 12/13/02 12/15/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	15.69	15.13	16.13	200	
	2	13.84	13.37	14.37	450	76.9
Phenanthrene	1	13.59	13.11	14.11	330	
	2	11.13	10.59	11.59	290	12.9
Fluoranthene	1	15.03	14.55	15.55	1600	
	2	13.06	12.57	13.57	400	120.0
Chrysene	1	17.02	16.45	17.45	23	
	2	16.98	16.48	17.48	2400	196.2
Benzo(b)fluoranthene	1	18.58	18.07	19.07	27	
	2	18.74	18.30	19.30	150	139.0
Benzo(k)fluoranthene	1	18.85	18.22	19.22	25	
	2	19.86	19.29	20.29	42	50.7
Benzo(a)anthracene	1	17.02	16.45	17.45	23	
	2	16.34	15.80	16.80	220	162.1
Acenaphthylene	1	12.67	12.23	13.23	53	
	2	8.65	7.87	8.87	820	175.7

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 1/22/03
DV Level: II **III** IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
____ CLP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: T2788
Test Name: PEST
Method No.: 8081A

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

	collected	Extracted	analyzed
11/18/02 11/14/02	11/15/02	11/26/02	12/11/02
	11/20/02	4	5

Soil

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes: EQ blanks in R2788 all ND ✓

4.0 Initial and Continuing Calibration

		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		

Notes: CC 12111,02 4,4-DDT -16.27
Methoxychlor -15.54 all ND, UJ, C in all

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?			
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?			
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.			
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?			
5.4	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			
5.5	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).			
5.6	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).			
5.7	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).			
5.8	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).			

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
6.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			✓
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
1 out	high/low	No action	No action
2 out	2 high same column	K	No action
	2 low same column	L, UL	No action
	mixed same column	J, UJ	No action
	2 high diff columns	J	Not applicable
	2 low diff columns	J, UJ	Not applicable
	mixed diff columns	Professional judgement	Not applicable
3 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	2 high, 1 low	K (2 high)	J (1 low 2nd column)
	2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
	other mixed	J, UJ	Not applicable
4 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	Mixed	J, UJ	Not applicable

If any recovery is >0% and <10% then L(+)/R(-).

If any recovery is 0% then R(+/-).

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached comment only

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			✓

Notes:

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		✓	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes: 71 5513 aroclor-1254 J,q

11.0 Pesticide Cleanup Checks (Required when any positive result is reported > 38 ug/Kg for soils)		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
12.1.4	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = _____			

Notes:

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN34 Calibration Date: 12/11/02 Time: 1855

Lab File ID: 119ZINDAMUT Init. Calib. Date(s): 12/07/02 12/08/02

Init. Calib. Times: 2306 0958

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1861960.0	1772975.0	0.01	-4.78	15.00	AVRG	
alpha-BHC	1929382.5	1886100.0	0.01	-2.24	15.00	AVRG	
beta-BHC	596651.25	586237.50	0.01	-1.74	15.00	AVRG	
delta-BHC	1838245.0	1809225.0	0.01	-1.58	15.00	AVRG	
gamma-BHC (Lindane)	1828942.5	1760325.0	0.01	-3.75	15.00	AVRG	
4,4'-DDD	1101938.1	1024712.5	0.01	-7.01	15.00	AVRG	
4,4'-DDE	1500515.0	1410125.0	0.01	-6.02	15.00	AVRG	
4,4'-DDT ✓	782036.67	654808.33	0.01	-16.27	15.00	AVRG	<-
Dieldrin	1610876.3	1452062.5	0.01	-9.86	15.00	AVRG	
Endosulfan I	1500215.0	1350925.0	0.01	-9.95	15.00	AVRG	
Endosulfan II	1272820.0	1127500.0	0.01	-11.42	15.00	AVRG	
Endosulfan sulfate	1175517.5	1011562.5	0.01	-13.95	15.00	AVRG	
Endrin	1480122.5	1369912.5	0.01	-7.45	15.00	AVRG	
Endrin Aldehyde	1052303.8	897781.25	0.01	-14.68	15.00	AVRG	
Heptachlor	1922021.6	1863650.0	0.01	-3.04	15.00	AVRG	
Heptachlor Epoxide	1725150.0	1644000.0	0.01	-4.70	15.00	AVRG	
Methoxychlor	563996.25	476320.00	0.01	-15.54	15.00	AVRG	<-
Toxaphene	76963.750		0.01	-100.00	15.00	AVRG	<-
(2)	89922.000		0.01	-100.00	15.00	AVRG	<-
(3)	77498.000		0.01	-100.00	15.00	AVRG	<-
(4)	75316.000		0.01	-100.00	15.00	AVRG	<-
(5)	55141.750		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	11111.667	11117.333	0.01	0.05	15.00	AVRG	
(2)	15485.067	15408.333	0.01	-0.50	15.00	AVRG	
(3)	27942.867	27160.333	0.01	-2.80	15.00	AVRG	
(4)	18003.400	18667.667	0.01	3.69	15.00	AVRG	
(5)	12050.600	12548.000	0.01	4.13	15.00	AVRG	
Aroclor-1221	3106.7500		0.01	-100.00	15.00	AVRG	<-
(2)	4799.2500		0.01	-100.00	15.00	AVRG	<-
(3)	3234.5000		0.01	-100.00	15.00	AVRG	<-
(4)	13000.750		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	13015.667		0.01	-100.00	15.00	AVRG	<-
(2)	6743.3330		0.01	-100.00	15.00	AVRG	<-
(3)	12216.000		0.01	-100.00	15.00	AVRG	<-
(4)	4879.6670		0.01	-100.00	15.00	AVRG	<-
(5)	9007.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	9970.0000		0.01	-100.00	15.00	AVRG	<-
(2)	12706.500		0.01	-100.00	15.00	AVRG	<-
(3)	22825.500		0.01	-100.00	15.00	AVRG	<-
(4)	18079.500		0.01	-100.00	15.00	AVRG	<-
(5)	15341.000		0.01	-100.00	15.00	AVRG	<-

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix Spike - EPA Sample No.: TESTPIT2F

COMPOUND	SPIKE ADDED (ug/Kg	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Aldrin	8.3	7.2	87	18	40	50-150
alpha-BHC	8.3	5.0	60	22	40	50-150
beta-BHC	8.3	13	157*	7	40	50-150
delta-BHC	8.3	1.9	23*	62*	40	50-150
gamma-BHC (Lindane)	8.3	5.9	71	23	40	50-150
4,4'-DDD	21	13	62	17	40	50-150
4,4'-DDE	21	17	81	12	40	50-150
4,4'-DDT	21	35	167*	13	40	50-150
Dieldrin	21	14	67	7	40	50-150
Endosulfan I	8.3	6.3	76	15	40	50-150
Endosulfan II	21	15	71	14	40	50-150
Endosulfan sulfate	21	8.1	38*	16	40	50-150
Endrin	21	16	76	28	40	50-150
Endrin Aldehyde	21	3.7	18*	24	40	50-150
Heptachlor	8.3	6.0	72	31	40	50-150
Heptachlor Epoxide	8.3	7.5	90	5	40	50-150
Methoxychlor	21	17	81	27	40	50-150
Endrin Ketone	21	17	81	12	40	50-150
gamma-Chlordane	8.3	9.5	114	17	40	50-150
alpha-Chlordane	8.3	6.5	78	11	40	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 1 out of 20 outside limits
Spike Recovery: 11 out of 40 outside limits

COMMENTS: _____

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Matrix Spike - EPA Sample No.: TESTPIT2F

COMPOUND	SPIKE ADDED (ug/Kg	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Aldrin	8.3	0.0	6.0	72	50-150
alpha-BHC	8.3	0.0	4.0	48*	50-150
beta-BHC	8.3	0.0	14	169*	50-150
delta-BHC	8.3	0.0	1.0	12*	50-150
gamma-BHC (Lindane)	8.3	0.0	4.7	57	50-150
4,4'-DDD	21	0.0	11	52	50-150
4,4'-DDE	21	0.0	15	71	50-150
4,4'-DDT	21	0.0	40	190*	50-150
Dieldrin	21	0.0	13	62	50-150
Endosulfan I	8.3	0.0	7.3	88	50-150
Endosulfan II	21	0.0	13	62	50-150
Endosulfan sulfate	21	0.0	9.5	45*	50-150
Endrin	21	0.0	12	57	50-150
Endrin Aldehyde	21	0.0	2.9	14*	50-150
Heptachlor	8.3	0.0	4.4	53	50-150
Heptachlor Epoxide	8.3	0.0	7.1	86	50-150
Methoxychlor	21	0.0	13	62	50-150
Endrin Ketone	21	0.0	15	71	50-150
gamma-Chlordane	8.3	0.0	8.0	96	50-150
alpha-Chlordane	8.3	0.0	5.8	70	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

10B

EPA SAMPLE NO.

PESTICIDE IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

71SS13

Lab Name: COMPUCHEM Contract: 8081A/8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-15 Date(s) Analyzed: 12/11/02 12/11/02

Instrument ID (1): VARIAN34 Instrument ID (2): VARIAN35

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	11.07	10.99	11.13	46		
Aroclor-1254	2	12.25	12.20	12.34	61		
	3	13.13	13.08	13.22	45		
COLUMN 1	4						
	5					51	
	1	13.60	13.55	13.69	95		
	2	15.05	15.01	15.15	72		
	3	15.82	15.80	15.94	81		
COLUMN 2	4						
	5					83	47.8
	1	13.73	13.68	13.81	48		
Aroclor-1260	2	15.74	15.69	15.83	54		
	3	16.76	16.71	16.85	29		
COLUMN 1	4	17.64	17.59	17.73	26		
	5	19.69	19.63	19.77	18	35	
	1	16.41	16.36	16.50	36		
	2	17.86	17.80	17.94	43		
	3	19.66	19.61	19.75	34		
COLUMN 2	4	20.83	20.77	20.91	41		
	5	22.76	22.70	22.84	23	35	0.0
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

DATA VALIDATION WORKSHEET

PCBs

Reviewer: RA
Date: 4/7/03
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Commuchem
SDG No.: T2788
Test Name: PCB
Method No.: 8082

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

collected	extracted	analyzed
11/15/02	11/19/02	11/2/02
11/14/02	"	" 12/13/02
11/18/02	11/20/02	11/22/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes: EB in SDG R2788 all ND

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? 1016 & 1260 require a minimum of three peaks and five concentrations. The remaining arochlors are required to run one standard during calibration.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			

Notes:

CC 11/2/02 at 1656 Aroclor-1260 16.48%.
11/2/02 " 2029 " 17.21%.

CC 12/13/02 at 0942 ↓ 18%. Pos. → J, c
" " 1341 ↓ 21.4%.

5.0 Surrogate Recovery

		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
5.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.4	If No in Section 5.3, are these sample(s) or method blank(s) reanalyzed?			✓
5.5	If No in Section 5.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
1 out	high/low	No action	No action
2 out	2 high same column	K	No action
	2 low same column	L, UL	No action
	mixed same column	J, UJ	No action
	2 high diff columns	J	Not applicable
	2 low diff columns	J, UJ	Not applicable
	mixed diff columns	Professional judgement	Not applicable
3 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	2 high, 1 low	K (2 high)	J (1 low 2nd column)
	2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
	other mixed	J, UJ	Not applicable
4 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	Mixed	J, UJ	Not applicable

If any recovery is >0% and <10% then L(+)/R(-).

If any recovery is 0% then R(+/-).

Notes: 405B4F TCX 26% 743-135 No action based on one failure.

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			✓
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			✓
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: NO MS/MSD were provided.

7.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)? Generally, no action is taken on the basis of field duplicate results. Only discussed in the DV report.	✓		✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		✓	✓

Notes:

	406B1F	0-5	
1016	250	220 U	OKU
Aroclor-1254	1400	960	(37% RPD)
" -1260	500	260	(63% RPD)

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		✓	
9.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes: several > 40%. → J, g

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

8D
PESTICIDE ANALYTICAL SEQUENCE

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

GC Column: CLPEST ID: 0.53 (mm) Init. Calib. Date(s): 11/17/02 11/17/02

Instrument ID: VARIAN43

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
TCX: 2.89 DCB: 13.41

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TCX RT #	DCB RT #
01	AR166015S	AR166015S	11/17/02	1305	2.88	13.41
02	AR166025S	AR166025S	11/17/02	1328	2.88	13.41
03	AR166035S	AR166035S	11/17/02	1352	2.88	13.41
04	AR166045S	AR166045S	11/17/02	1415	2.88	13.41
05	AR166055S	AR166055S	11/17/02	1439	2.89	13.41
06	AR122145S	AR122145S	11/17/02	1503	2.88	13.41
07	AR123245S	AR123245S	11/17/02	1526	2.89	13.41
08	AR124245S	AR124245S	11/17/02	1550	2.89	13.41
09	AR124845S	AR124845S	11/17/02	1614	2.89	13.41
10	AR125445S	AR125445S	11/17/02	1638	2.88	13.41
11	PIBLK6Q	PIBLK6Q	11/21/02	0905	2.88	13.41
12	AR16606R	AR16606R	11/21/02	1053	2.88	13.41
13	PBLKVW	WG21475-1	11/21/02	1126	2.88	13.41
14	PLCSVW	WG21475-2	11/21/02	1234	2.88	13.41
15	40SB4F	T2788-5	11/21/02	1258	2.88	13.41
16	40SB1F	T2788-13	11/21/02	1322	2.87	13.40
17	D-5	T2788-14	11/21/02	1345	2.87	13.40
18	40SB5C	T2788-3	11/21/02	1433	2.88	13.40
19	40SB4A	T2788-4	11/21/02	1457	2.88	13.41
20	40SB1B	T2788-6	11/21/02	1520	2.88	13.40
21	40SB1C	T2788-7	11/21/02	1544	2.88	13.40
22	PIBLK6S	PIBLK6S	11/21/02	1632	2.87	13.41
23	AR16606T	AR16606T	11/21/02	1656	2.88	13.40
24	40SB2F	T2788-9	11/21/02	1720	2.88	13.40
25	40SB2B	T2788-10	11/21/02	1744	2.88	13.40
26	40SB2C	T2788-11	11/21/02	1808	2.87	13.40
27	PIBLK6U	PIBLK6U	11/21/02	2008	2.87	13.40
28	AR16606V	AR16606V	11/21/02	2029	2.88	13.41
29						
30						
31						
32						

QC LIMITS
TCX = Tetrachloro-m-xylene (+/- 0.07 MINUTES)
DCB = Decachlorobiphenyl (+/- 0.07 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

8D
PESTICIDE ANALYTICAL SEQUENCE

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

GC Column: CLPEST2 ID: 0.53 (mm) Init. Calib. Date(s): 11/17/02 11/17/02

Instrument ID: VARIAN46

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
TCX: 3.85 DCB: 15.63

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TCX RT #	DCB RT #
01	AR166015S	AR166015S	11/17/02	1305	3.84	15.63
02	AR166025S	AR166025S	11/17/02	1328	3.84	15.63
03	AR166035S	AR166035S	11/17/02	1352	3.84	15.63
04	AR166045S	AR166045S	11/17/02	1415	3.84	15.63
05	AR166055S	AR166055S	11/17/02	1439	3.85	15.63
06	AR122145S	AR122145S	11/17/02	1503	3.84	15.63
07	AR123245S	AR123245S	11/17/02	1526	3.84	15.63
08	AR124245S	AR124245S	11/17/02	1550	3.85	15.63
09	AR124845S	AR124845S	11/17/02	1614	3.84	15.63
10	AR125445S	AR125445S	11/17/02	1638	3.84	15.63
11	PIBLK6R	PIBLK6R	11/21/02	0905	3.84	15.63
12	AR16606R	AR16606R	11/21/02	1053	3.83	15.62
13	PBLKVW	WG21475-1	11/21/02	1126	3.84	15.63
14	PLCSVW	WG21475-2	11/21/02	1234	3.84	15.63
15	40SB4F	T2788-5	11/21/02	1258	3.83	15.62
16	40SB1F	T2788-13	11/21/02	1322	3.83	15.62
17	D-5	T2788-14	11/21/02	1345	3.83	15.62
18	40SB5C	T2788-3	11/21/02	1433	3.83	15.62
19	40SB4A	T2788-4	11/21/02	1457	3.84	15.62
20	40SB1B	T2788-6	11/21/02	1520	3.84	15.62
21	40SB1C	T2788-7	11/21/02	1544	3.83	15.62
22	PIBLK6T	PIBLK6T	11/21/02	1632	3.83	15.62
~~23~~	AR16606T	AR16606T	11/21/02	1656	3.83	15.62
24	40SB2F	T2788-9	11/21/02	1720	3.84	15.62
25	40SB2B	T2788-10	11/21/02	1744	3.84	15.62
26	40SB2C	T2788-11	11/21/02	1808	3.83	15.62
27	PIBLK6V	PIBLK6V	11/21/02	2008	3.83	15.62
~~28~~	AR16606V	AR16606V	11/21/02	2029	3.84	15.63
29						
30						
31						
32						

QC LIMITS
TCX = Tetrachloro-m-xylene (+/- 0.07 MINUTES)
DCB = Decachlorobiphenyl (+/- 0.07 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN43 Calibration Date: 11/21/02 Time: 1656

Lab File ID: 126DAR16606T Init. Calib. Date(s): 11/17/02 11/17/02

Init. Calib. Times: 1305 1638

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF8.0000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aroclor-1016	6813.3670	7370.6667	0.01	8.18	15.00	AVRG	AVG. = 8.21%
(2)	11516.200	12123.333	0.01	5.27	15.00	AVRG	
(3)	20556.067	25107.333	0.01	22.14	15.00	AVRG	<-
(4)	9300.2330	10167.667	0.01	9.33	15.00	AVRG	
(5)	9816.8000	9439.0000	0.01	-3.85	15.00	AVRG	
Aroclor-1221	2133.0000		0.01	-100.00	15.00	AVRG	<-
(2)	3025.0000		0.01	-100.00	15.00	AVRG	<-
(3)	1231.0000		0.01	-100.00	15.00	AVRG	<-
(4)	8670.0000		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	7591.6670		0.01	-100.00	15.00	AVRG	<-
(2)	4993.6670		0.01	-100.00	15.00	AVRG	<-
(3)	8705.0000		0.01	-100.00	15.00	AVRG	<-
(4)	3622.0000		0.01	-100.00	15.00	AVRG	<-
(5)	3391.6670		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	6572.5000		0.01	-100.00	15.00	AVRG	<-
(2)	9603.5000		0.01	-100.00	15.00	AVRG	<-
(3)	16887.500		0.01	-100.00	15.00	AVRG	<-
(4)	6928.5000		0.01	-100.00	15.00	AVRG	<-
(5)	2547.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1248	7825.5000		0.01	-100.00	15.00	AVRG	<-
(2)	16683.000		0.01	-100.00	15.00	AVRG	<-
(3)	11639.500		0.01	-100.00	15.00	AVRG	<-
(4)	13124.000		0.01	-100.00	15.00	AVRG	<-
(5)	6175.5000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1254	9136.5000		0.01	-100.00	15.00	AVRG	<-
(2)	16191.500		0.01	-100.00	15.00	AVRG	<-
(3)	16099.500		0.01	-100.00	15.00	AVRG	<-
(4)	10864.000		0.01	-100.00	15.00	AVRG	<-
(5)	14518.000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1260	26793.000	29509.333	0.01	10.14	15.00	AVRG	
(2)	12941.367	14409.667	0.01	11.34	15.00	AVRG	AVG. = 16.48%
(3)	47671.133	54572.667	0.01	14.48	15.00	AVRG	
(4)	10476.033	13903.333	0.01	32.72	15.00	AVRG	<-
(5)	10144.366	11536.667	0.01	13.72	15.00	AVRG	
Tetrachloro-m-xylene	354492.50	382159.38	0.01	7.80	15.00	AVRG	
Decachlorobiphenyl	497046.25	505386.50	0.01	1.68	15.00	AVRG	

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN43 Calibration Date: 11/21/02 Time: 2029

Lab File ID: 133DAR16606V Init. Calib. Date(s): 11/17/02 11/17/02

Init. Calib. Times: 1305 1638

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF8.0000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aroclor-1016	6813.3670	7605.3333	0.01	11.62	15.00	AVRG	
(2)	11516.200	12558.667	0.01	9.05	15.00	AVRG	
(3)	20556.067	26477.000	0.01	28.80	15.00	AVRG	<-
(4)	9300.2330	10808.333	0.01	16.22	15.00	AVRG	<-
(5)	9816.8000	10005.667	0.01	1.92	15.00	AVRG	
Aroclor-1221	2133.0000		0.01	-100.00	15.00	AVRG	<-
(2)	3025.0000		0.01	-100.00	15.00	AVRG	<-
(3)	1231.0000		0.01	-100.00	15.00	AVRG	<-
(4)	8670.0000		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	7591.6670		0.01	-100.00	15.00	AVRG	<-
(2)	4993.6670		0.01	-100.00	15.00	AVRG	<-
(3)	8705.0000		0.01	-100.00	15.00	AVRG	<-
(4)	3622.0000		0.01	-100.00	15.00	AVRG	<-
(5)	3391.6670		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	6572.5000		0.01	-100.00	15.00	AVRG	<-
(2)	9603.5000		0.01	-100.00	15.00	AVRG	<-
(3)	16887.500		0.01	-100.00	15.00	AVRG	<-
(4)	6928.5000		0.01	-100.00	15.00	AVRG	<-
(5)	2547.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1248	7825.5000		0.01	-100.00	15.00	AVRG	<-
(2)	16683.000		0.01	-100.00	15.00	AVRG	<-
(3)	11639.500		0.01	-100.00	15.00	AVRG	<-
(4)	13124.000		0.01	-100.00	15.00	AVRG	<-
(5)	6175.5000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1254	9136.5000		0.01	-100.00	15.00	AVRG	<-
(2)	16191.500		0.01	-100.00	15.00	AVRG	<-
(3)	16099.500		0.01	-100.00	15.00	AVRG	<-
(4)	10864.000		0.01	-100.00	15.00	AVRG	<-
(5)	14518.000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1260	26793.000	29640.333	0.01	10.63	15.00	AVRG	
(2)	12941.367	13907.667	0.01	7.47	15.00	AVRG	
(3)	47671.133	53826.000	0.01	12.91	15.00	AVRG	
(4)	10476.033	14303.333	0.01	36.53	15.00	AVRG	<-
(5)	10144.366	12022.000	0.01	18.51	15.00	AVRG	<-
Tetrachloro-m-xylene	354492.50	399068.75	0.01	12.57	15.00	AVRG	
Decachlorobiphenyl	497046.25	531006.25	0.01	6.83	15.00	AVRG	

AVG. = 17.5%

AVG. = 17.21%

FORM VII PEST

8D
PESTICIDE ANALYTICAL SEQUENCE

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

GC Column: CLPEST ID: 0.53 (mm) Init. Calib. Date(s): 12/09/02 12/09/02

Instrument ID: VARIAN43

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
TCX: 2.86 DCB: 13.39

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TCX RT #	DCB RT #
01	AR166018X	AR166018X	12/09/02	1544	2.86	13.39
02	AR166028X	AR166028X	12/09/02	1607	2.87	13.39
03	AR166038X	AR166038X	12/09/02	1631	2.87	13.39
04	AR166048X	AR166048X	12/09/02	1655	2.86	13.39
05	AR166058X	AR166058X	12/09/02	1719	2.86	13.39
06	AR122148X	AR122148X	12/09/02	1743	2.86	13.39
07	AR123248X	AR123248X	12/09/02	1806	2.86	13.38
08	AR124248X	AR124248X	12/09/02	1830	2.86	13.39
09	AR124848X	AR124848X	12/09/02	1854	2.86	13.39
10	AR125448X	AR125448X	12/09/02	1918	2.86	13.39
11	PIBLK9U	PIBLK9U	12/13/02	0919	2.86	13.39
~~12~~	AR16609V	AR16609V	12/13/02	0942	2.86	13.38
13	40SB5F	T2788-2	12/13/02	1229	2.86	13.38
14	PIBLK9W	PIBLK9W	12/13/02	1317	2.86	13.38
15	AR16609X	AR16609X	12/13/02	1341	2.86	13.39
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

QC LIMITS

TCX = Tetrachloro-m-xylene (+/- 0.07 MINUTES)
DCB = Decachlorobiphenyl (+/- 0.07 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

8D
PESTICIDE ANALYTICAL SEQUENCE

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

GC Column: CLPEST2 ID: 0.53 (mm) Init. Calib. Date(s): 12/09/02 12/09/02

Instrument ID: VARIAN46

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
TCX: 3.82 DCB: 15.60

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TCX RT #	DCB RT #
01	AR166018X	AR166018X	12/09/02	1544	3.82	15.60
02	AR166028X	AR166028X	12/09/02	1607	3.82	15.60
03	AR166038X	AR166038X	12/09/02	1631	3.82	15.60
04	AR166048X	AR166048X	12/09/02	1655	3.82	15.60
05	AR166058X	AR166058X	12/09/02	1719	3.82	15.60
06	AR122148X	AR122148X	12/09/02	1743	3.82	15.60
07	AR123248X	AR123248X	12/09/02	1806	3.81	15.60
08	AR124248X	AR124248X	12/09/02	1830	3.82	15.60
09	AR124848X	AR124848X	12/09/02	1854	3.81	15.60
10	AR125448X	AR125448X	12/09/02	1918	3.81	15.60
11	PIBLK9V	PIBLK9V	12/13/02	0919	3.81	15.60
~~12~~	AR16609V	AR16609V	12/13/02	0942	3.81	15.60
13	40SB5F	T2788-2	12/13/02	1229	3.81	15.59
14	PIBLK9X	PIBLK9X	12/13/02	1317	3.81	15.60
15	AR16609X	AR16609X	12/13/02	1341	3.82	15.60
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

QC LIMITS

TCX = Tetrachloro-m-xylene (+/- 0.07 MINUTES)
DCB = Decachlorobiphenyl (+/- 0.07 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN46 Calibration Date: 12/13/02 Time: 0942

Lab File ID: 120GAR16609V Init. Calib. Date(s): 12/09/02 12/09/02

Init. Calib. Times: 1544 1918

GC Column: CLPEST2 ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF8.0000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aroclor-1016	6426.2000	6771.0000	0.01	5.36	15.00	AVRG	
(2)	12252.633	12962.667	0.01	5.79	15.00	AVRG	
(3)	25340.400	26855.333	0.01	5.98	15.00	AVRG	
(4)	11610.167	12352.333	0.01	6.39	15.00	AVRG	
(5)	7719.6330	8447.3333	0.01	9.43	15.00	AVRG	
Aroclor-1221	1729.5000		0.01	-100.00	15.00	AVRG	<-
(2)	3047.2500		0.01	-100.00	15.00	AVRG	<-
(3)	2130.7500		0.01	-100.00	15.00	AVRG	<-
(4)	8170.5000		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	7472.3330		0.01	-100.00	15.00	AVRG	<-
(2)	5062.3330		0.01	-100.00	15.00	AVRG	<-
(3)	10303.000		0.01	-100.00	15.00	AVRG	<-
(4)	2861.3330		0.01	-100.00	15.00	AVRG	<-
(5)	2134.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	5622.0000		0.01	-100.00	15.00	AVRG	<-
(2)	10030.000		0.01	-100.00	15.00	AVRG	<-
(3)	20281.500		0.01	-100.00	15.00	AVRG	<-
(4)	9587.0000		0.01	-100.00	15.00	AVRG	<-
(5)	7566.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1248	12167.000		0.01	-100.00	15.00	AVRG	<-
(2)	10614.000		0.01	-100.00	15.00	AVRG	<-
(3)	14312.500		0.01	-100.00	15.00	AVRG	<-
(4)	6862.0000		0.01	-100.00	15.00	AVRG	<-
(5)	6455.5000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1254	14567.500		0.01	-100.00	15.00	AVRG	<-
(2)	18314.500		0.01	-100.00	15.00	AVRG	<-
(3)	26712.000		0.01	-100.00	15.00	AVRG	<-
(4)	19505.000		0.01	-100.00	15.00	AVRG	<-
(5)	32770.500		0.01	-100.00	15.00	AVRG	<-
Aroclor-1260	36352.100	40015.667	0.01	10.08	15.00	AVRG	
(2)	25629.100	28823.667	0.01	12.46	15.00	AVRG	
(3)	51168.767	58326.000	0.01	13.99	15.00	AVRG	
(4)	29628.300	37788.333	0.01	27.54	15.00	AVRG	<-
(5)	9237.7670	11990.667	0.01	29.80	15.00	AVRG	<-
Tetrachloro-m-xylene	398124.06	441068.75	0.01	10.79	15.00	AVRG	
Decachlorobiphenyl	368933.13	468203.12	0.01	26.91	15.00	AVRG	<-

FORM VII PEST

AVG. = 18%

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN46 Calibration Date: 12/13/02 Time: 1341

Lab File ID: 130GAR16609X Init. Calib. Date(s): 12/09/02 12/09/02

Init. Calib. Times: 1544 1918

GC Column: CLPEST2 ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF8.0000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aroclor-1016	6426.2000	6770.3333	0.01	5.36	15.00	AVRG	
(2)	12252.633	13190.000	0.01	7.65	15.00	AVRG	
(3)	25340.400	27235.000	0.01	7.48	15.00	AVRG	
(4)	11610.167	12485.000	0.01	7.54	15.00	AVRG	
(5)	7719.6330	8104.0000	0.01	4.98	15.00	AVRG	
Aroclor-1221	1729.5000		0.01	-100.00	15.00	AVRG	<-
(2)	3047.2500		0.01	-100.00	15.00	AVRG	<-
(3)	2130.7500		0.01	-100.00	15.00	AVRG	<-
(4)	8170.5000		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	7472.3330		0.01	-100.00	15.00	AVRG	<-
(2)	5062.3330		0.01	-100.00	15.00	AVRG	<-
(3)	10303.000		0.01	-100.00	15.00	AVRG	<-
(4)	2861.3330		0.01	-100.00	15.00	AVRG	<-
(5)	2134.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	5622.0000		0.01	-100.00	15.00	AVRG	<-
(2)	10030.000		0.01	-100.00	15.00	AVRG	<-
(3)	20281.500		0.01	-100.00	15.00	AVRG	<-
(4)	9587.0000		0.01	-100.00	15.00	AVRG	<-
(5)	7566.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1248	12167.000		0.01	-100.00	15.00	AVRG	<-
(2)	10614.000		0.01	-100.00	15.00	AVRG	<-
(3)	14312.500		0.01	-100.00	15.00	AVRG	<-
(4)	6862.0000		0.01	-100.00	15.00	AVRG	<-
(5)	6455.5000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1254	14567.500		0.01	-100.00	15.00	AVRG	<-
(2)	18314.500		0.01	-100.00	15.00	AVRG	<-
(3)	26712.000		0.01	-100.00	15.00	AVRG	<-
(4)	19505.000		0.01	-100.00	15.00	AVRG	<-
(5)	32770.500		0.01	-100.00	15.00	AVRG	<-
Aroclor-1260	36352.100	40447.667	0.01	11.27	15.00	AVRG	
(2)	25629.100	30459.333	0.01	18.85	15.00	AVRG	<-
(3)	51168.767	63223.000	0.01	23.56	15.00	AVRG	<- AVG. = 21.4%
(4)	29628.300	37416.333	0.01	26.28	15.00	AVRG	<-
(5)	9237.7670	11749.667	0.01	27.19	15.00	AVRG	<-
Tetrachloro-m-xylene	398124.06	443393.75	0.01	11.37	15.00	AVRG	
Decachlorobiphenyl	368933.13	457284.38	0.01	23.95	15.00	AVRG	<-

2F
SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

GC Column(1): CLPEST ID: 0.53 (mm) GC Column(2): CLPEST2 ID: 0.53 (mm)

	EPA SAMPLE NO.	TCX 1 %REC #	TCX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PBLKVW	85	71	87	80			0
02	PLCSVW	72	67	86	73			0
03	40SB4F	72	264D	49	44			0
04	40SB1F	84	71	75	74			0
05	D-5	73	73	70	66			0
06	40SB5C	81	71	72	60			0
07	40SB4A	85	73	77	69			0
08	40SB1B	83	72	75	64			0
09	40SB1C	82	70	86	73			0
10	40SB2F	49	60	76	63			0
11	40SB2B	83	73	82	72			0
12	40SB2C	72	63	77	65			0
13	71SB11C	66	64	69	67			0
14	71SB11B	62	59	66	63			0
15	71SB11F	66	67	61	58			0
16	PLCSWK	80	75	72	58			0
17	PBLKWK	81	78	80	79			0
18	40SB5F	48	54	60	71			0
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

ADVISORY
QC LIMITS

S1 (TCX) = Tetrachloro-m-xylene (43-135)
S2 (DCB) = Decachlorobiphenyl (43-144)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

10B

PESTICIDE IDENTIFICATION SUMMARY FOR MULTICOMPONENT ANALYTES

EPA SAMPLE NO.

40SB1F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-13 Date(s) Analyzed: 11/21/02 11/21/02

Instrument ID (1): VARIAN43 Instrument ID (2): VARIAN46

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	3.57	3.51	3.65	100		
Aroclor-1016	2	4.25	4.19	4.33	110		
	3	5.14	5.08	5.22	120		
COLUMN 1	4	5.40	5.34	5.47	84		
	5					100	
	1	4.92	4.86	5.00	57		
	2	5.79	5.73	5.87	100		
	3	6.73	6.67	6.81	180		
COLUMN 2	4	7.00	6.94	7.08	150		
	5	7.96	7.89	8.03	780	250	85.7
	1	6.93	6.86	7.00	950		
Aroclor-1254	2	7.45	7.38	7.52	830		
	3	8.18	8.12	8.26	1300		
COLUMN 1	4	9.07	9.01	9.15	1900		
	5	9.59	9.54	9.68	1900	1400	
	1	8.79	8.72	8.86	440		
	2	9.19	9.12	9.26	890		
	3	10.06	10.00	10.14	920		
COLUMN 2	4	10.52	10.46	10.60	1300		
	5	11.53	11.47	11.61	990	910	42.4
	1	10.26	10.20	10.34	450		
Aroclor-1260	2	10.86	10.80	10.95	340		
	3	11.37	11.32	11.46	630		
COLUMN 1	4	12.54	12.49	12.63	560		
	5					500	
	1	11.71	11.65	11.79	310		
	2	12.76	12.71	12.85	280		
	3	13.44	13.38	13.52	370		
COLUMN 2	4	14.55	14.49	14.63	480		
	5					360	32.6

At least 3 peaks are required for identification of multicomponent analytes.

10B
PESTICIDE IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

EPA SAMPLE NO.

40SB2F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-9 Date(s) Analyzed: 11/21/02 11/21/02

Instrument ID (1): VARIAN43 Instrument ID (2): VARIAN46

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	6.93	6.86	7.00	93		
Aroclor-1254	2	7.45	7.38	7.52	170		
	3	8.18	8.12	8.26	93		
COLUMN 1	4	9.07	9.01	9.15	160		
	5	9.59	9.54	9.68	200	150	
	1	8.79	8.72	8.86	32		
	2	9.19	9.12	9.26	81		
	3	10.06	10.00	10.14	62		
COLUMN 2	4	10.52	10.46	10.60	170		
	5	11.53	11.47	11.61	130	96	43.9
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

10B

PESTICIDE IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

EPA SAMPLE NO.

40SB4F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-5 Date(s) Analyzed: 11/21/02 11/21/02

Instrument ID (1): VARIAN43 Instrument ID (2): VARIAN46

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	6.92	6.86	7.00	1600		
Aroclor-1254	2	7.45	7.38	7.52	1900		
	3	8.19	8.12	8.26	1800		
COLUMN 1	4	9.07	9.01	9.15	2900		
	5	9.59	9.54	9.68	5000	2600	
	1	8.79	8.72	8.86	350		
	2	9.19	9.12	9.26	1300		
	3	10.06	10.00	10.14	1300		
COLUMN 2	4	10.52	10.46	10.60	1700		
	5	11.53	11.47	11.61	1300	1200	73.7
	1	10.26	10.20	10.34	280		
Aroclor-1260	2	10.86	10.80	10.95	230		
	3	11.37	11.32	11.46	610		
COLUMN 1	4	12.54	12.49	12.63	280		
	5					350	
	1	10.87	10.81	10.95	620		
	2	11.71	11.65	11.79	220		
	3	12.76	12.71	12.85	170		
COLUMN 2	4	13.44	13.38	13.52	250		
	5					320	9.0
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

10B

PESTICIDE IDENTIFICATION SUMMARY FOR MULTICOMPONENT ANALYTES

EPA SAMPLE NO.

71SB11F

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-16 Date(s) Analyzed: 11/22/02 11/22/02

Instrument ID (1): VARIAN43 Instrument ID (2): VARIAN46

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	3.57	3.50	3.64	67		
Aroclor-1016	2	4.25	4.18	4.32	67		
	3	5.14	5.08	5.21	77		
COLUMN 1	4	5.40	5.33	5.47	59		
	5					68	
	1	4.92	4.86	5.00	75		
	2	5.79	5.72	5.86	66		
	3	6.73	6.66	6.80	70		
COLUMN 2	4	7.00	6.93	7.07	49		
	5					65	4.5
	1	6.92	6.86	7.00	260		
Aroclor-1254	2	7.44	7.38	7.51	330		
	3	8.18	8.12	8.26	340		
COLUMN 1	4	9.07	9.01	9.14	300		
	5	9.59	9.53	9.67	360	320	
	1	8.79	8.72	8.86	230		
	2	9.18	9.12	9.26	340		
	3	10.06	9.99	10.13	320		
COLUMN 2	4	10.86	10.80	10.94	300		
	5	11.53	11.47	11.61	330	310	3.2
	1	10.25	10.20	10.34	84		
Aroclor-1260	2	10.86	10.80	10.94	45		
	3	11.36	11.31	11.45	110		
COLUMN 1	4	12.54	12.48	12.62	54		
	5					73	
	1	11.71	11.64	11.78	52		
	2	12.76	12.70	12.84	40		
	3	13.43	13.37	13.51	50		
COLUMN 2	4	14.54	14.48	14.62	38		
	5					45	47.4

At least 3 peaks are required for identification of multicomponent analytes.

10B

PESTICIDE IDENTIFICATION SUMMARY FOR MULTICOMPONENT ANALYTES

EPA SAMPLE NO.

D-5

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

Lab Sample ID: T2788-14 Date(s) Analyzed: 11/21/02 11/21/02

Instrument ID (1): VARIAN43 Instrument ID (2): VARIAN46

GC Column(1): CLPEST ID: 0.53(mm) GC Column(2): CLPEST2 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	RPD
	1	6.93	6.86	7.00	690		
Aroclor-1254	2	7.44	7.38	7.52	920		
	3	8.18	8.12	8.26	860		
COLUMN 1	4	9.07	9.01	9.15	1200		
	5	9.59	9.54	9.68	1100	960	
	1	9.19	9.12	9.26	610		
	2	10.06	10.00	10.14	620		
	3	10.52	10.46	10.60	830		
COLUMN 2	4	11.53	11.47	11.61	640		
	5					670	35.6
	1	10.26	10.20	10.34	230		
Aroclor-1260	2	10.86	10.80	10.95	170		
	3	11.37	11.32	11.46	370		
COLUMN 1	4	12.54	12.49	12.63	290		
	5					260	
	1	11.71	11.65	11.79	160		
	2	12.76	12.71	12.85	130		
	3	13.44	13.38	13.52	180		
COLUMN 2	4	14.55	14.49	14.63	230		
	5					170	41.9
	1						
	2						
	3						
COLUMN 1	4						
	5						
	1						
	2						
	3						
COLUMN 2	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 1/22/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: T2788
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	√		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	√		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		√	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	√		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	√		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	√		
	Action: If the temperature of the cooler was elevated (> 10 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".			√
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		√	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		√	

Notes:

collected	extracted	analyzed
11/14/02 > 11/15/02	11/20/02	12/3/02 > 11/23/02
11/18/02	11/21/02	12/4/02
11/20/02	11/26/02	12/4/02

Soil

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: EQ blanks in SDG R27858 are ND

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: IC 12/3/02 RDX %RSD 51.7% acid ND in assoc. samples → UJ/R
See attached acid ND neg. biased UJ/C unless prev flagged for IC failure

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 2416 - trinitrotoluene MS/MSD 210/155 / 50-150%.
no action

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes: 4-amino-2,6-dinitrotoluene 160 / 50-150 all ND, no flags

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 405B1 F1 D-5
all ND

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		✓	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			
	% Completeness = _____			

Notes:

FORM 6
8330 INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN74 Calibration Date(s): 12/03/02 12/03/02

Column: C18 ID: 3.90 (mm) Calibration Time(s): 0133 0439

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2
HMX	AVRG	1297.24800	17.6
1,3,5-Trinitrobenzene	AVRG	4352.48320	3.9
RDX	AVRG	2468.55040	51.7
1,3-Dinitrobenzene	AVRG	5174.72640	4.6
2,4,6-Trinitrotoluene	AVRG	1325.15200	9.7
Tetryl	AVRG	2891.65440	3.8
Nitrobenzene	AVRG	5783.30880	3.8
2,4-Dinitrotoluene	AVRG	4688.85760	4.7
2,6-Dinitrotoluene	AVRG	2325.08960	7.6
2-Amino-4,6-dinitrotoluene	AVRG	3425.08000	3.2
4-Amino-2,6-dinitrotoluene	AVRG	2309.55840	7.1
2-Nitrotoluene	AVRG	2101.16000	3.5
4-Nitrotoluene	AVRG	1735.74720	6.6
3-Nitrotoluene	AVRG	2236.08800	4.0
1,4-Dinitrobenzene	AVRG	4070.83040	3.7

8D
PESTICIDE ANALYTICAL SEQUENCE

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

GC Column: C18 ID: 3.90 (mm) Init. Calib. Date(s): 11/19/02 11/19/02

Instrument ID: VARIAN74

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 12.64

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #	RT #
01	FULL5ST	FULL5ST	11/19/02	1547	12.62	
02	FULL4ST	FULL4ST	11/19/02	1634	12.66	
03	FULL3ST	FULL3ST	11/19/02	1720	12.62	
04	FULL2ST	FULL2ST	11/19/02	1807	12.67	
05	FULL1ST	FULL1ST	11/19/02	1853	12.62	
06	FULL4TC	FULL4TC	11/22/02	2331	12.38	
07	LIBLKTC	LIBLKTC	11/23/02	0036	12.42	
08	PBLKVZ	WG21479-1	11/23/02	0603	12.39	
09	PLCSVZ	WG21479-2	11/23/02	0650	12.41	
10	40SB5A	T2788-1	11/23/02	0736	12.41	
11	40SB5F	T2788-2	11/23/02	0823	12.41	
12	FULL4TD	FULL4TD	11/23/02	0909	12.41	
13						
14						
15						
16						
17						
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32						

QC LIMITS
S1 = 1,4-Dinitrobenzene (+/- 0.50 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

FORM VIII PEST

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN74 Calibration Date: 11/22/02 Time: 2331

Lab File ID: 098NFULL4TC Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1398.4640	1398.4640	0.01	5.97	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	3675.6800	3675.6800	0.01	0.72	15.00	AVRG	
RDX	32.784004	31.250000	1671.7440	0.01	-4.91		LINR	
1,3-Dinitrobenzene	4880.9730	5430.2080	5430.2080	0.01	11.25	15.00	AVRG	
2,4,6-Trinitrotoluene ✓	2567.0750	1643.2960	1643.2960	0.01	-35.98	15.00	AVRG	<-
Tetryl	3844.6050	3518.4320	3518.4320	0.01	-8.48	15.00	AVRG	
Nitrobenzene	7689.2100	7036.8640	7036.8640	0.01	-8.48	15.00	AVRG	
2,4-Dinitrotoluene ✓	3994.7010	4933.0560	4933.0560	0.01	23.49	15.00	AVRG	<-
2,6-Dinitrotoluene	2601.4990	2557.1520	2557.1520	0.01	-1.70	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3316.8000	3316.8000	0.01	1.54	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	54.009553	62.500000	2624.3360	0.01	13.58		LINR	
2-Nitrotoluene	1987.5310	2069.6960	2069.6960	0.01	4.13	15.00	AVRG	
4-Nitrotoluene ✓	1448.9760	1767.1840	1767.1840	0.01	21.96	15.00	AVRG	<-
3-Nitrotoluene ✓	1945.6140	2287.7440	2287.7440	0.01	17.58	15.00	AVRG	<-
1,4-Dinitrobenzene	3915.6410	4034.9840	4034.9840	0.01	3.05	15.00	AVRG	

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN74 Calibration Date: 11/23/02 Time: 0909

Lab File ID: 110NFULL4TD Init. Calib. Date(s): 11/19/02 11/19/02

Init. Calib. Times: 1547 1853

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF or AMOUNT	RRF31.250 or AMOUNT	CCAL RRF31.250	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
HMX	1319.6830	1317.1520	1317.1520	0.01	-0.19	15.00	AVRG	
1,3,5-Trinitrobenzene	3649.5740	4283.8080	4283.8080	0.01	17.38	15.00	AVRG	<-
RDX	35.667151	31.250000	1808.1600	0.01	-14.13		LINR	
1,3-Dinitrobenzene ✓	4880.9730	6019.2000	6019.2000	0.01	23.32	15.00	AVRG	<-
2,4,6-Trinitrotoluene ✓	2567.0750	2080.6080	2080.6080	0.01	-18.95	15.00	AVRG	<-
Tetryl	3844.6050	3775.4880	3775.4880	0.01	-1.80	15.00	AVRG	
Nitrobenzene	7689.2100	7550.9760	7550.9760	0.01	-1.80	15.00	AVRG	
2,4-Dinitrotoluene ✓	3994.7010	5273.2800	5273.2800	0.01	32.01	15.00	AVRG	<-
2,6-Dinitrotoluene	2601.4990	2685.1680	2685.1680	0.01	3.22	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3266.3100	3507.0400	3507.0400	0.01	7.37	15.00	AVRG	
4-Amino-2,6-dinitrotoluene ✓	49.989592	62.500000	2403.6160	0.01	20.02		LINR	
2-Nitrotoluene	1987.5310	2211.6160	2211.6160	0.01	11.27	15.00	AVRG	
4-Nitrotoluene ✓	1448.9760	1873.4880	1873.4880	0.01	29.30	15.00	AVRG	<-
3-Nitrotoluene ✓	1945.6140	2441.6160	2441.6160	0.01	25.49	15.00	AVRG	<-
1,4-Dinitrobenzene	3915.6410	4309.7840	4309.7840	0.01	10.06	15.00	AVRG	

FORM VII 8330

8D
PESTICIDE ANALYTICAL SEQUENCE

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

GC Column: C18 ID: 3.90 (mm) Init. Calib. Date(s): 12/03/02 12/03/02

Instrument ID: VARIAN74

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 13.18

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #	RT #
01	FULL5GB	FULL5GB	12/03/02	0133	13.20	
02	FULL4GB	FULL4GB	12/03/02	0219	13.16	
03	FULL3GB	FULL3GB	12/03/02	0306	13.22	
04	FULL2GB	FULL2GB	12/03/02	0352	13.16	
05	FULL1GB	FULL1GB	12/03/02	0439	13.15	
06	FULL4GC	FULL4GC	12/03/02	0612	13.13	
07	LIBLKGC	LIBLKGC	12/03/02	0658	13.12	
08	40SB5C	T2788-3	12/03/02	1137	13.32	
09	40SB4A	T2788-4	12/03/02	1223	13.28	
10	40SB4F	T2788-5	12/03/02	1310	13.16	
11	40SB1B	T2788-6	12/03/02	1356	13.21	
12	40SB1C	T2788-7	12/03/02	1443	13.34	
13	FULL4GD	FULL4GD	12/03/02	1529	13.27	
14	LIBLKGD	LIBLKGD	12/03/02	1616	13.28	
15	40SB2A	T2788-8	12/03/02	1702	13.27	
16	40SB2F	T2788-9	12/03/02	1749	13.29	
17	40SB2B	T2788-10	12/03/02	1835	13.28	
18	40SB2C	T2788-11	12/03/02	1922	13.21	
19	40SB1A	T2788-12	12/03/02	2008	13.27	
20	40SB1F	T2788-13	12/03/02	2055	13.34	
21	D-5	T2788-14	12/03/02	2141	13.27	
22	PBLKWN	WG21515-1	12/03/02	2228	13.19	
23	PLCSWN	WG21515-2	12/03/02	2314	13.25	
24	FULL4GE	FULL4GE	12/04/02	0001	13.28	
25	LIBLKGE	LIBLKGE	12/04/02	0047	13.33	
26	71SS13	T2788-15	12/04/02	0133	13.23	
27	71SB11F	T2788-16	12/04/02	0220	13.30	
28	71SB11B	T2788-17	12/04/02	0306	13.32	
29	71SB11C	T2788-18	12/04/02	0353	13.25	
30	PBLKYD	WG21646-1	12/04/02	0439	13.23	
31	PLCSYD	WG21646-2	12/04/02	0526	13.18	
32	TESTPIT2FMS	WG21646-4	12/04/02	0612	13.24	

QC LIMITS
S1 = 1,4-Dinitrobenzene (+/- 0.50 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

8D
PESTICIDE ANALYTICAL SEQUENCE

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

GC Column: C18 ID: 3.90 (mm) Init. Calib. Date(s): 12/03/02 12/03/02

Instrument ID: VARIAN74

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 13.18

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #	RT #
01	TESTPIT2FMSD	WG21646-5	12/04/02	0659	13.27	
02	TESTPIT2F	T2788-19	12/04/02	0745	13.26	
03	TESTPIT2BP	T2788-20	12/04/02	0832	13.24	
04	FULL4GF	FULL4GF	12/04/02	0918	13.32	
05						
06						
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32						

QC LIMITS
S1 = 1,4-Dinitrobenzene (+/- 0.50 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN74 Calibration Date: 12/03/02 Time: 0612

Lab File ID: 008HFULL4GC Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1374.8160	0.01	5.98	15.00	AVRG	
1,3,5-Trinitrobenzene	4352.4830	4651.9040	0.01	6.88	15.00	AVRG	
RDX	2468.5500	1723.1680	0.01	-30.20	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5381.1840	0.01	3.99	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1475.5840	0.01	11.35	15.00	AVRG	
Tetryl	2891.6540	2940.0800	0.01	1.67	15.00	AVRG	
Nitrobenzene	5783.3090	5880.1600	0.01	1.67	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	4890.0480	0.01	4.29	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2401.5680	0.01	3.29	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3562.5120	0.01	4.01	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2410.7040	0.01	4.38	15.00	AVRG	
2-Nitrotoluene	2101.1600	2190.6720	0.01	4.26	15.00	AVRG	
4-Nitrotoluene	1735.7470	1846.0640	0.01	6.36	15.00	AVRG	
3-Nitrotoluene	2236.0880	2336.2240	0.01	4.48	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4187.1360	0.01	2.86	15.00	AVRG	

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN74 Calibration Date: 12/03/02 Time: 1529

Lab File ID: 020HFULL4GD Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	$\overline{RRF}$ OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1647.7120	0.01	27.02	15.00	AVRG	<-
1,3,5-Trinitrobenzene	4352.4830	4536.7360	0.01	4.23	15.00	AVRG	
RDX	2468.5500	1805.1520	0.01	-26.87	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5414.3360	0.01	4.63	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1601.6960	0.01	20.87	15.00	AVRG	<-
Tetryl	2891.6540	2815.9520	0.01	-2.62	15.00	AVRG	
Nitrobenzene	5783.3090	5631.9040	0.01	-2.62	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	5065.4080	0.01	8.03	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2478.8640	0.01	6.61	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3684.9120	0.01	7.59	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2426.6240	0.01	5.07	15.00	AVRG	
2-Nitrotoluene	2101.1600	2215.0240	0.01	5.42	15.00	AVRG	
4-Nitrotoluene	1735.7470	1885.8080	0.01	8.64	15.00	AVRG	
3-Nitrotoluene	2236.0880	2385.7760	0.01	6.69	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4232.4480	0.01	3.97	15.00	AVRG	

FORM VII 8330

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN74 Calibration Date: 12/04/02 Time: 0001

Lab File ID: 031HFULL4GE Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1672.9920	0.01	28.96	15.00	AVRG	<-
1,3,5-Trinitrobenzene	4352.4830	4560.4160	0.01	4.78	15.00	AVRG	
RDX	2468.5500	1843.5520	0.01	-25.32	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5478.6880	0.01	5.87	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1666.8480	0.01	25.78	15.00	AVRG	<-
Tetryl	2891.6540	2937.9200	0.01	1.60	15.00	AVRG	
Nitrobenzene	5783.3090	5875.8400	0.01	1.60	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	5048.8640	0.01	7.68	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2500.5120	0.01	7.54	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3733.8400	0.01	9.01	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2460.8160	0.01	6.55	15.00	AVRG	
2-Nitrotoluene	2101.1600	2228.7680	0.01	6.07	15.00	AVRG	
4-Nitrotoluene	1735.7470	1891.6640	0.01	8.98	15.00	AVRG	
3-Nitrotoluene	2236.0880	2385.0240	0.01	6.66	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4293.2160	0.01	5.46	15.00	AVRG	

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Instrument ID: VARIAN74 Calibration Date: 12/04/02 Time: 0918

Lab File ID: 043HFULL4GF Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 - 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1387.8080	0.01	6.98	15.00	AVRG	
1,3,5-Trinitrobenzene	4352.4830	4674.5920	0.01	7.40	15.00	AVRG	
RDX	2468.5500	1825.9200	0.01	-26.03	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5675.4240	0.01	9.68	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1507.0080	0.01	13.72	15.00	AVRG	
Tetryl	2891.6540	2728.5920	0.01	-5.64	15.00	AVRG	
Nitrobenzene	5783.3090	5457.1840	0.01	-5.64	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	5280.0640	0.01	12.61	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2513.5040	0.01	8.10	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3715.8720	0.01	8.49	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2375.5520	0.01	2.86	15.00	AVRG	
2-Nitrotoluene	2101.1600	2295.7600	0.01	9.26	15.00	AVRG	
4-Nitrotoluene	1735.7470	1939.0880	0.01	11.71	15.00	AVRG	
3-Nitrotoluene	2236.0880	2431.9680	0.01	8.76	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4496.0720	0.01	10.45	15.00	AVRG	

FORM VII 8330

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix Spike - EPA Sample No.: TESTPIT2F

COMPOUND	SPIKE ADDED (mg/Kg	SAMPLE CONCENTRATION (mg/Kg)	MS CONCENTRATION (mg/Kg)	MS % REC #	QC. LIMITS REC.
HMX	3.0	0.0	2.5	83	50-150
1,3,5-Trinitrobenzene	2.0	0.0	1.9	95	50-150
RDX	2.0	0.0	2.2	110	50-150
1,3-Dinitrobenzene	2.0	0.0	2.3	115	50-150
2,4,6-Trinitrotoluene	2.0	0.0	4.2	210*	50-150
Tetryl	3.0	0.0	2.7	90	50-150
Nitrobenzene	2.0	0.0	1.4	70	50-150
2,4-Dinitrotoluene	2.0	0.0	2.2	110	50-150
2,6-Dinitrotoluene	3.0	0.0	3.5	117	50-150
2-Amino-4,6-dinitrotolu	3.0	0.0	3.0	100	50-150
4-Amino-2,6-dinitrotolu	3.0	0.0	3.5	117	50-150
2-Nitrotoluene	3.0	0.0	3.3	110	50-150
4-Nitrotoluene	3.0	0.0	3.3	110	50-150
3-Nitrotoluene	3.0	0.0	3.2	107	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix Spike - EPA Sample No.: TESTPIT2F

COMPOUND	SPIKE ADDED (mg/Kg	MSD CONCENTRATION (mg/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	3.0	2.3	77	8	30	50-150
1,3,5-Trinitrobenzene	2.0	1.8	90	5	30	50-150
RDX	2.0	2.0	100	10	30	50-150
1,3-Dinitrobenzene	2.0	2.2	110	4	30	50-150
2,4,6-Trinitrotoluene	2.0	3.1	155*	30	30	50-150
Tetryl	3.0	2.7	90	0	30	50-150
Nitrobenzene	2.0	1.4	70	0	30	50-150
2,4-Dinitrotoluene	2.0	2.3	115	4	30	50-150
2,6-Dinitrotoluene	3.0	2.7	90	26	30	50-150
2-Amino-4,6-dinitrotolu	3.0	2.8	93	7	30	50-150
4-Amino-2,6-dinitrotolu	3.0	3.0	100	15	30	50-150
2-Nitrotoluene	3.0	3.1	103	6	30	50-150
4-Nitrotoluene	3.0	3.0	100	10	30	50-150
3-Nitrotoluene	3.0	3.1	103	3	30	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 14 outside limits
Spike Recovery: 2 out of 28 outside limits

COMMENTS: _____

3F
SOIL PESTICIDE LAB CONTROL SAMPLE

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

COMPOUND	SPIKE ADDED (mg/Kg	LCS CONCENTRATION (mg/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	3.0	2.0	67	50-150
1,3,5-Trinitrobenzene	2.0	2.2	110	50-150
RDX	2.0	2.5	130	50-150
1,3-Dinitrobenzene	2.0	2.9	150	50-150
2,4,6-Trinitrotoluene	2.0	3.0	150	50-150
Tetryl	3.0	2.9	97	50-150
Nitrobenzene	2.0	1.5	75	50-150
2,4-Dinitrotoluene	2.0	2.8	140	50-150
2,6-Dinitrotoluene	3.0	3.6	120	50-150
2-Amino-4,6-dinitrotolu	3.0	3.3	110	50-150
4-Amino-2,6-dinitrotolu	3.0	4.8	160 *	50-150
2-Nitrotoluene	3.0	3.0	100	50-150
4-Nitrotoluene	3.0	3.3	110	50-150
3-Nitrotoluene	3.0	3.0	100	50-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 1 out of 14 outside limits

COMMENTS: _____

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: RA
Date: 1/21/03
DV Level: II III IV

Review Document:

_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: T2788
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

collected	extracted	analyzed
11/15/02	11/20/02	12/1/02 > 11/25/02
11/14/02	"	11/25/02
11/18/02	11/21/02	11/26/02
11/20/02	11/26/02	12/5/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: EQ blanks in SDG RZ788 all ND

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			✓
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			✓
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?	✓	✓	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: 1,4-dinitrobenzene TQC 50-150
D-5 420%.
re-analyzed D-5RR 420 %. ND, no flag

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		✓

Notes: 405B1F1 D-5 all ND

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		✓	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			
	% Completeness = _____			

Notes:

2F

SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: T2788

GC Column(1): C18 ID: 3.90 (mm)

	EPA SAMPLE NO.	S1 %REC #	S2 %REC #	S3 %REC #	S4 %REC #	S5 %REC #	S6 %REC #	TOT OUT
01	40SB5A	100						0
02	40SB5F	110						0
03	40SB5C	97						0
04	40SB4A	100						0
05	40SB4F	110						0
06	40SB1B	97						0
07	PBLKWN	130						0
08	71SS13	110						0
09	71SB11F	130						0
10	71SB11B	120						0
11	71SB11C	110						0
12	PBLKVZ	110						0
13	PLCSWA	110						0
14	40SB1C	100						0
15	40SB2A	96						0
16	40SB2F	61						0
17	40SB2B	97						0
18	40SB2C	99						0
19	40SB1A	100						0
20	40SB1F	130						0
21	D-5	420 *						1
22	PLCSWO	100						0
23	PBLKYD	86						0
24	PLCSYE	93						0
25	TESTPIT2FMS	130						0
26	TESTPIT2FMSD	98						0
27	TESTPIT2F	130						0
28	TESTPIT2BP	90						0
29	D-5RR	420 *						1
30								

ADVISORY QC LIMITS

S1 = 1,4-Dinitrobenzene (50-150)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: T2788
Project No.: 15295137.10000

Project Name: Radford SWMU 40/71
Reviewer: RH
Date: 1/24/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{o}C \pm 2\ ^{o}C$)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: collected 11/14/15, 18/20/02 — analyzed 11/26/02 (4) 11/27/02 (4 ICP) Hg

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%?		✓				
	<50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						

Note: all 130%.
As 86.7 LiW, ULiW
Copper 64.6 ULiW, LiW
nickel 119.8
Potassium 117.4
Se 126.4 KiW
Na 76.8 LiW
Tl 76.7 ~~ULiW~~ RiM

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L						
4.5	Are there reported field blankor trip blank values > ± MDL?						
	Sample Results > MDL						
	< 5X Blank Contamination B						

Note: MB→ba 0.043, copper .205, Mg 6.737, Potassium 12.744, zn .147 mg/kg all 75x, no flag ICB, CCB also low levels ba, Mg, Cu, Be, Cu, K, and neg. as all either pre or 75x. flags see EQ blanks in R2488 also low levels ba, cr, Mn, sodium all 75x blank

5.0 ICP Interference Check Sample (ICS)

Silver 3, 2.7 ug/L pos<5x ⇒ B/x

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note: _____

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	

Action:	Solid		Aqueous		
	< LCL	> UCL	< 50%	50% - 79%	> 120%
	L(+)/UL(-)	K(+)	L(+)/R(-)	L(+)/UL(-)	K(+)

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.		✓		✓	✓	

Note: ~~Al, Sb, beryllium, Ca, K, Mg, Na~~ outside QC for all except antimony beryllium, potassium, silver, sodium

J/UJ, K unless prev.

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓		
	%R > 125% 30%< %R < 74% < 30%						
	Positive K L						
	Non-detect None UL R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.			✓			✓

Note: antimony 49.7/60.1 → 40L#, Cr 141.2 all prev. due to lab dup-
copper -46.4/-62.5 pos prev. flagged for lab dup, ND → R, m
Thallium 5.4/11.4 all ND → R, m

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?						

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note: Potassium 10.4%. pos → J, S

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		✓			✓	

Note: 405B1F – D-S
Arsenic, iron, magnesium, Mn, Hg, nickel, Potassium, Selenium, vanadium >ac – comment – See attached

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓		
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note:

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples: 20						
13.1.2	Number of target compounds in each analysis: 23						
13.1.3	Number of results rejected and not reported: 21						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 98%						

Note:

	405B1F	D-5	RPD
Al	14100	13500	4% ✓
sb	1.2	.86 OKV	
As	95.6	38.3	85%
ba	108	80.1	29% ✓
be	.73	.52 OKV	
cd	.98	1 OKV	
cr	25.3	22.5 OKV	
Co	7.7	5.9 OKV	
cu	34.3	38.3 OKV	
Fe	105000	28300	115%
Pb	51.9	65.7 OKV	
Mg	6330	4130	42%
Mn	527	336	44%
Hg	.38	2.1	138%
ni	19.0	12.8	38%
K	2240	1140	65%
Se	12.6	2.3	138%
Na	565	672	17% OKV
V	35.9	23.8	40%
Zn	106	128	17% OKV

2B-IN
CRDL STANDARD FOR AA AND ICP

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

AA CRDL Standard Source: HIPUR

ICP CRDL Standard Source: HIPUR

Concentration Units: ug/L

Analyte	True	Found	%R	CRDL Standard for ICP Initial True	Found	%R	Final Found	%R
Aluminum				100.0	129.95	130.0		
Antimony				10.0	10.02	100.2		
Arsenic				10.0	8.67	86.7		
Barium				10.0	10.25	102.5		
Beryllium				5.0	5.12	102.4		
Cadmium				5.0	5.48	109.6		
Calcium				1000.0	1063.58	106.4		
Chromium				5.0	4.65	93.0		
Cobalt				5.0	4.89	97.8		
Copper				5.0	3.23	64.6		
Iron				100.0	104.80	104.8		
Lead				3.0	2.86	95.3		
Magnesium				1000.0	1000.13	100.0		
Manganese				10.0	9.97	99.7		
Mercury	0.2	0.19	95.0					
Nickel				5.0	5.99	119.8		
Potassium				1000.0	1174.08	117.4		
Selenium				5.0	6.32	126.4		
Silver				5.0	4.81	96.2		
Sodium				2000.0	1536.16	76.8		
Thallium				10.0	7.67	76.7		
Vanadium				20.0	19.77	98.8		
Zinc				20.0	21.20	106.0		

Control Limits: no limits have been established by EPA at this time

SW846 METALS

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BLANKS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: T2788

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	21.8	U	21.8	U	21.8	U	90.6	B	2.180	U	P
Antimony	3.7	U	3.7	U	3.7	U	3.7	U	0.370	U	P
Arsenic	2.5	U	2.5	U	2.5	U	-2.6	B	0.250	U	P
Barium	0.4	B	0.5	B	0.5	B	0.7	B	0.043	B	P
Beryllium	0.1	U	0.1	B	0.2	B	0.2	B	0.010	U	P
Cadmium	0.4	U	0.4	U	0.4	U	0.4	U	0.040	U	P
Calcium	9.6	U	21.4	B	9.6	U	86.9	B	0.960	U	P
Chromium	0.6	U	0.6	U	0.6	U	0.6	U	0.060	U	P
Cobalt	0.6	U	0.6	U	0.6	U	0.6	U	0.060	U	P
Copper	1.4	U	1.4	U	1.4	U	1.4	U	0.205	B	P
Iron	13.7	U	13.7	U	13.7	U	29.0	B	1.370	U	P
Lead	2.3	U	2.3	U	2.3	U	2.3	U	0.230	U	P
Magnesium	63.6	B	86.1	B	75.1	B	145.9	B	6.737	B	P
Manganese	0.2	U	0.2	U	0.2	U	0.2	U	0.020	U	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.017	U	CV
Nickel	1.0	U	1.0	U	1.0	U	1.0	U	0.100	U	P
Potassium	118.5	U	118.5	U	118.5	U	118.5	U	12.744	B	P
Selenium	3.3	U	3.3	U	3.3	U	3.3	U	0.330	U	P
Silver	0.7	U	0.7	U	0.7	U	0.7	U	0.070	U	P
Sodium	248.7	U	248.7	U	248.7	U	248.7	U	24.870	U	P
Thallium	5.1	U	5.1	U	5.1	U	5.1	U	0.510	U	P
Vanadium	0.7	U	0.7	U	0.7	U	0.7	U	0.070	U	P
Zinc	1.0	U	1.0	U	1.0	U	1.0	U	0.147	B	P

SW846 METALS

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BLANKS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: T2788

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum			26.3	B	21.8	U	21.8	U			P
Antimony			3.7	U	3.7	U	3.7	U			P
Arsenic			2.5	U	2.5	U	2.5	U			P
Barium			0.5	B	0.7	B	0.5	B			P
Beryllium			0.1	U	0.2	B	0.1	U			P
Cadmium			0.4	U	0.4	U	0.4	U			P
Calcium			25.9	B	33.0	B	9.6	U			P
Chromium			0.6	U	0.6	U	0.6	U			P
Cobalt			0.6	U	0.6	U	0.6	U			P
Copper			1.4	U	1.4	B	1.4	U			P
Iron			13.7	U	13.7	U	13.7	U			P
Lead			2.3	U	2.3	U	2.3	U			P
Magnesium			91.4	B	95.3	B	75.1	B			P
Manganese			0.2	U	0.2	U	0.2	U			P
Mercury			0.1	U	0.1	U	0.1	U			CV
Nickel			1.0	U	1.0	U	1.0	U			P
Potassium			138.6	B	146.4	B	162.6	B			P
Selenium			3.3	U	3.3	U	3.3	U			P
Silver			0.7	U	0.7	U	0.7	U			P
Sodium			248.7	U	248.7	U	248.7	U			P
Thallium			5.1	U	5.1	U	5.1	U			P
Vanadium			0.7	U	0.7	U	0.7	U			P
Zinc			1.0	U	1.0	U	1.0	U			P

SW846 METALS

3

BLANKS

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum			21.8	U	21.8	U					P
Antimony			3.7	U	3.7	U					P
Arsenic			2.5	U	-2.6	B					P
Barium			0.4	B	0.5	B					P
Beryllium			0.1	U	0.1	U					P
Cadmium			0.4	U	0.4	U					P
Calcium			9.6	U	9.6	U					P
Chromium			0.6	U	0.6	U					P
Cobalt			0.6	U	0.6	U					P
Copper			1.4	U	1.4	U					P
Iron			13.7	U	13.7	U					P
Lead			2.3	U	2.3	U					P
Magnesium			70.9	B	68.7	B					P
Manganese			0.2	U	0.2	U					P
Nickel			1.0	U	1.0	U					P
Potassium			170.2	B	144.2	B					P
Selenium			3.3	U	3.3	U					P
Silver			0.7	U	0.7	U					P
Sodium			248.7	U	248.7	U					P
Thallium			5.1	U	5.1	U					P
Vanadium			0.7	U	0.7	U					P
Zinc			1.0	U	1.0	U					P

SW846 METALS

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DUPLICATES

SAMPLE NO.

TESTPIT2FD

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 80.3 % Solids for Duplicate: 80.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		4953.8618		2188.2920		77.4	*	P
Antimony	1.2	1.1736	B	1.8306		43.7		P
Arsenic		74.5596		508.4031		148.8	*	P
Barium		65.2397		37.4559		54.1	*	P
Beryllium		0.5793	B	0.6172	B	6.3		P
Cadmium		0.0498	U	0.0498	U			P
Calcium		1316.6021		930.3156		34.4	*	P
Chromium	0.6	12.2433		2.5233		131.6	*	P
Cobalt		8.0908		10.4643		25.6	*	P
Copper		80.6332		25.9382		102.6	*	P
Iron		34587.2500		119064.0000		110.0	*	P
Lead		35.4026		17.5921		67.2	*	P
Magnesium		1527.0270		625.3394		83.8	*	P
Manganese		273.6258		51.0500		137.1	*	P
Mercury		0.4905		0.3169		43.0	*	CV
Nickel		17.0826		42.1774		84.7	*	P
Potassium		1104.7629		1271.8920		14.1		P
Selenium		6.9811		24.2299		110.5	*	P
Silver	0.6	0.6009	B	0.8966		39.5		P
Sodium		206.8351	B	177.2865	B	15.4		P
Thallium		0.6351	U	0.6351	U		*	P
Vanadium	2.5	10.6652		3.7826		95.3	*	P
Zinc		62.2807		30.9707		67.2	*	P

SW846 METALS

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

TESTPIT2FS

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 80.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	32.1366		1.1736	B	62.27	49.7	N	P
Arsenic		49.7985		74.5596		4.98	-497.2		P
Barium	75 - 125	293.1493		65.2397		249.07	91.5		P
Beryllium	75 - 125	6.2406		0.5793	B	6.23	90.9		P
Cadmium	75 - 125	5.7155		0.0498	U	6.23	91.7		P
Chromium	75 - 125	47.4051		12.2433		24.91	141.2	N	P
Cobalt	75 - 125	68.4129		8.0908		62.27	96.9		P
Copper	75 - 125	66.1894		80.6332		31.13	-46.4	N	P
Lead		51.6027		35.4026		2.49	650.6		P
Manganese		139.5216		273.6258		62.27	-215.4		P
Mercury	75 - 125	0.6806		0.4905		0.21	90.5		CV
Nickel	75 - 125	76.2237		17.0826		62.27	95.0		P
Selenium		5.2064		6.9811		1.25	-142.0		P
Silver	75 - 125	5.9283		0.6009	B	6.23	85.5		P
Thallium	75 - 125	0.6351	U	0.6351	U	6.23	5.4	N	P
Vanadium	75 - 125	74.4138		10.6652		62.27	102.4		P
Zinc	75 - 125	135.7329		62.2807		62.27	118.0		P

Comments:

SW846 METALS

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

TESTPIT2FSD

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 80.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	38.5984		1.1736	B	62.27	60.1	N	P
Arsenic		39.8876		74.5596		4.98	-696.2		P
Barium	75 - 125	274.0320		65.2397		249.07	83.8		P
Beryllium	75 - 125	6.1583		0.5793	B	6.23	89.6		P
Cadmium	75 - 125	5.5216		0.0498	U	6.23	88.6		P
Chromium	75 - 125	35.6632		12.2433		24.91	94.0		P
Cobalt	75 - 125	69.0117		8.0908		62.27	97.8		P
Copper	75 - 125	61.1909		80.6332		31.13	-62.5	N	P
Lead		72.5409		35.4026		2.49	1491.5		P
Manganese	75 - 125	137.8512		273.6258		62.27	-218.0		P
Mercury	75 - 125	0.7364		0.4905		0.21	117.1		CV
Nickel	75 - 125	80.7012		17.0826		62.27	102.2		P
Selenium		6.4812		6.9811		1.25	-40.0		P
Silver	75 - 125	6.4560		0.6009	B	6.23	94.0		P
Thallium	75 - 125	0.7074	B	0.6351	U	6.23	11.4	N	P
Vanadium	75 - 125	69.9112		10.6652		62.27	95.1		P
Zinc	75 - 125	118.2721		62.2807		62.27	89.9		P

Comments:

9
ICP SERIAL DILUTIONS

SAMPLE NO.

TESTPIT2FL

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2788

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	39779.51		42327.37		6.4		P
Antimony	9.42	B	18.50	U	100.0		P
Arsenic	598.71		637.40		6.5		P
Barium	523.87		541.20		3.3		P
Beryllium	4.65	B	4.86	B	4.5		P
Cadmium	0.40	U	2.00	U			P
Calcium	10572.31		11350.96		7.4		P
Chromium	98.31		99.06		0.8		P
Cobalt	64.97		69.62		7.2		P
Copper	647.48		653.34		0.9		P
Iron	277735.59		294264.31		6.0		P
Lead	284.28		306.44		7.8		P
Magnesium	12262.03		13487.68		10.0		P
Manganese	2197.22		2306.76		5.0		P
Nickel	137.17		142.00		3.5		P
Potassium	8871.24		9796.56		10.4	E	P
Selenium	56.06		78.07		39.3		P
Silver	4.83	B	4.64	B	3.9		P
Sodium	1660.89	B	1915.13	B	15.3		P
Thallium	5.10	U	25.50	U			P
Vanadium	85.64		87.20	B	1.8		P
Zinc	500.11		546.79		9.3		P

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: _____U2788_____ **Fraction: _VOCs, SVOCs, Pest., PCBs, PAH, ___ Explosives, Nitroglycerin, Metals _____**

Lab: _CompuChem_____ **Project Name: __Radford SWMU 40/71_____**

Reviewer: _____RA, AJ_____ **Date: _____February 14, 2003_____**

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the VOC analyses, severe loss of internal standards were reported in samples TESTPIT1F and TESTPIT1F2. All associated sample results were flagged "R,i". These samples were re-analyzed with better recoveries and the results from re-analyses should be used for these samples.

For the SVOC analyses, the CCV analyzed on 11/29/02 at 2129 displayed a %D greater than the control limit (i.e., 20%) with a negative bias for atrazine at 58.29%. All associated sample results were non-detects and were flagged "R,c."

For the metals analyses, the MS/MSD recoveries for antimony (25.7%/29.4%) and thallium (-6.7%/8.5%) were less than the lower QC limit (i.e., 75-125%). Non-detects were flagged "R,m" in the associated samples. Positive results were previously flagged due to other anomalies and no further data qualifying action was required.

Minor Anomalies: For the VOC analyses, the method blank analyzed on 12/1/02 contained methylene chloride at 0.6 ug/Kg, toluene at 3 ug/Kg, 1,4-dichlorobenzene at 0.3 ug/Kg and 1,2,4-trichlorobenzene at 0.6 ug/Kg. The method blank analyzed on 12/2/02 contained toluene at 3 ug/Kg, 1,3-dichlorobenzene at 0.3 ug/Kg, 1,4-dichlorobenzene at 0.3 ug/Kg, 1,2-dichlorobenzene at 0.2 ug/Kg, and 1,2,4-trichlorobenzene at 0.8 ug/Kg. Positive results less than 10 times the blank concentration for methylene chloride and less than 5 times the blank concentration for the other compounds were flagged "B,z" in the associated samples. The trip and equipment blanks located in SDG R2788 contained positive results for toluene. These results were previously flagged for method blank contamination and no further data qualifying action was required.

The ICV analyzed on 11/28/02 displayed a %RSD greater than the control limit (i.e., 15%) with a positive bias for toluene at 25.45%. These results were previously flagged for method blank contamination and no further data qualifying action was required.

The CCV analyzed on 12/1/02 at 1629 displayed %Ds greater than the control limit (i.e., 20%) with a negative bias for dichlorodifluoromethane at 28.05% and bromomethane at 39.86%. The CCV analyzed on 12/2/02 at 1217 displayed %Ds greater than the control limit with a negative bias for bromomethane at 23.47%, carbon disulfide at 31.56%, and methyl acetate at 24.76%. Positive results were flagged "J,c" and non-detects were flagged "UJ,c" in the associated samples.

The internal standard areas for chlorobenzene-d_5 and 1,4-dichlorobenzene-d_4 in sample TESTPIT1FRE and 1,4-dichlorobenzene-d4 in sample TESTPIT1F2RE were less than the QC limit. Positive results were flagged "J,i" and non-detects were flagged "UJ,i" for the associated compounds.

For the SVOC analyses, the initial calibration analyzed on 11/25/02 displayed %RSDs greater than the control limit (i.e., 15%) for benzaldehyde at 18.78%, 2,4-dimethylphenol at 17.40%, hexachlorocyclopentadiene at 17.61%, n-nitrosodiphenylamine at 15.84%, and atrazine at 69.75%. Non-detects were flagged "UJ,r" for atrazine unless previously flagged due to other anomalies. Positive results were flagged "J,r" for the other compounds in the associated samples.

The CCV analyzed on 12/3/02 at 0818 displayed %Ds greater than the control limit with a negative bias for hexachlorocyclopentadiene at 22.2%, 2,4-dinitrophenol at 22.9%, 4-chlorophenyl-phenylether at 22.9%, atrazine at 44.8%, dibenzo(a,h)anthracene at 33.9%, and benzo(g,h,i)perylene at 34.7% and with a positive bias for 2,2-oxybis(1-chloropropane) at 25.8%. Positive results were flagged "J,c" and non-detects were flagged "UJ,c" unless previously flagged due to other anomalies.

The internal standard area for perylene-d_{12} was less than the QC limit in sample TESTPIT1F2. Positive results were flagged "J,i" and non-detects were flagged "UJ,i" for the associated compounds. This sample was re-analyzed at a dilution factor of 2 with acceptable recoveries and results from the dilution analyses should be used for the affected compounds.

For the pesticides analyses, the CCVs analyzed on 11/21/02 at 2128, 2148, 2208, 2128 displayed a %D greater than the control limit (i.e., 15%) with a positive bias for 4,4,-DDT at 59.92%, 59.92%, 59.92%, and 70.71%, respectively. The CCV analyzed on 11/21/02 at 2128 displayed a %D greater than the control limit with a positive bias for methoxychlor at 16.21%. All associated sample results were

non-detects and no data qualifying action was required. The CCV analyzed on 12/17/02 at 1604 displayed a %D greater than the control limit with a negative bias for methoxychlor at 15.76%. No data qualifying action was required since the %D was acceptable on the other column and the associated samples were non-detects for methoxychlor.

The recovery for surrogate tetrachloro-m-xylene (1900%) was greater than the upper QC limit (i.e., 135%) in sample TESTPIT1F. No action was required since this sample was analyzed at a dilution factor of 20. The recoveries for surrogate decachlorobiphenyl (40%/33%) and tetrachloro-m-xylene (40%) were less than the lower QC limit in sample TESTPIT1F2. Positive results were flagged "L,s" and non-detects were flagged "UL,s" unless previously flagged due to other anomalies.

The LCS recoveries for 4,4-DDT (130%/140%) were greater than the upper QC limit (i.e., 128%). All associated sample results were non-detects and no data qualifying action was required.

For the PAH analyses, recoveries for surrogate, p-terphenyl were greater than the upper QC limit (i.e., 150%) in samples TESTPIT1F (430%) and TESTPIT1F2 (160%). No action was required since these samples were analyzed at dilution factors greater than 10.

Samples EQB-3RE, EQB-4RE, and EQB-5RE were re-extracted outside the holding time by 5, 6, or 7 days. All associated sample results were non-detects and were flagged "UJ,h." The original sample results should be used for data interpretation purposes. These samples were re-extracted since they were associated with a method blank, extracted on 11/19/02, that displayed positive results for all compounds except phenanthrene. The method blank extracted on 11/20/02 displayed a positive result for chrysene at 0.073 ug/L. Positive results less than 5 times the blank concentration were flagged "B,z" in the associated samples.

The %RPDs were greater than the QC limit for all compounds except anthracene in the field duplicate pair 40SB13C/D-6. No action is required based on field duplicate anomalies and no data flags were applied.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for several compounds in several samples. These results were flagged "J,g."

For the explosives analyses, the initial calibration analyzed on 12/3/02 displayed a %RSD greater than the QC limit (i.e., 20%) for RDX at 51.7%. All associated sample results were non-detects and were flagged "UJ,r."

The continuing calibration analyzed on 12/3/02 at 1529 displayed %Ds greater than the QC limit (i.e., 15%) with a positive bias for HMX at 27.02% and tetryl at 20.87% and with a negative bias for RDX at 26.87%. The continuing calibration analyzed on 12/4/02 at 0001 displayed %Ds greater than the QC limit (i.e., 15%) with a positive bias for HMX at 28.96% and tetryl at 25.78% and with a negative bias for RDX at 25.32%. The continuing calibrations analyzed on 12/4/02 at 0918 and 1427 displayed %Ds greater than the QC limit with a negative bias for RDX at 26.03% and 32.28%, respectively. The continuing calibration analyzed on 12/4/02 displayed a %D greater than the QC limit with a positive bias for HMX at 26.65% and with a negative bias for RDX at 28.12%. RDX non-detects were previously flagged due to initial calibration failure and no further data qualifying action was required. No positive results were reported for the other compounds and no data qualifying action was required.

For the metal analyses, the initial CRDL percent recoveries for aluminum (299.5%), antimony (77.1%), arsenic (72.8%), cadmium (123.5%), calcium (123.5%), copper (78.2%), iron (169.7%), lead (75.3%), magnesium (117.3%), selenium (137.4%), sodium (79.3%), and thallium (85.8%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "L,w" for antimony and "K,w" for cadmium and selenium in the associated samples. Positive results were either greater than 2xCRDL or were previously flagged for the other analytes, therefore, no further data qualifying action was required.

The equipment blanks located in SDG R2788 contained positive results for barium, copper, iron, potassium and sodium. Positive sodium results less than 5 times the blank concentration were flagged "B,x" in the associated samples. Positive results for the other analytes were greater than 5 times the blank concentration and no data qualifying action was required. The method blanks contained positive results for barium, magnesium and zinc. All associated sample results were greater than 5 times the blank concentration and no data qualifying action was required.

The initial and continuing calibration blanks also contained positive results for barium, magnesium, beryllium and calcium and negative results for arsenic. Positive arsenic results less than 5 times the blank concentration were flagged "L,o" in the associated samples. Positive results for the other analytes were greater than 5 times the blank concentration and no data qualifying action was required.

The %RPDs for the laboratory duplicates were greater than the QC limit (i.e., 35%) for copper (47.5%) and zinc (40.2%). Positive results were flagged "J,k" in all samples. The laboratory flagged calcium and magnesium results "*" for

laboratory duplicate failures. These flags were removed by the reviewer since the QC limit used by the laboratory was 20% and not the recommended 35%.

The MS recoveries for arsenic (56.6%), selenium (63.6%), and vanadium (127.1%) outside the QC limit (i.e., 75-125%). Arsenic results were previously flagged due to calibration blank contamination and no further data qualifying action was required. Positive results were flagged "L,m" for selenium and "K,m" for vanadium unless previously flagged due to other anomalies.

The %D for the serial dilution analysis was greater than the QC limit (i.e., 10%) for zinc at 19.4%. Positive results were flagged "J,s" unless previously flagged due to other anomalies.

Correctable Anomalies: None.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were raised.

It should be noted that TIC results were flagged "NJ,t" in the associated samples. Except for data flagged "R", all data as qualified, are usable for their intended purpose based on the data reviewed.

Signed: Ranjan

COC #

SAMPLENUM	CLIENTID	QUOTENUMREF		LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
U2788-1	40SB13A	Q2788	1097	U2788	SO	URS	RADFORD SWMU 40/71	11/20/02
U2788-2	40SB13B	Q2788	1097	U2788	SO	URS	RADFORD SWMU 40/71	11/20/02
U2788-3	40SB13C	Q2788	1097	U2788	SO	URS	RADFORD SWMU 40/71	11/20/02
U2788-4	D-6	Q2788	1097	U2788	SO	URS	RADFORD SWMU 40/71	11/20/02
U2788-5	TESTPIT1F	Q2788	1098	U2788	SO	URS	RADFORD SWMU 40/71	11/21/02
U2788-6	TESTPIT1F2	Q2788	1098	U2788	SO	URS	RADFORD SWMU 40/71	11/21/02

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-1

Sample wt/vol: 4.83 (g/mL) G Lab File ID: U2788-1B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 15 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U UJ,C
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	6	U UJ,C
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	U
75-15-0	Carbon disulfide	2	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	6	U
67-64-1	Acetone	24	
75-09-2	Methylene Chloride	6	U
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl-tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-butanone	15	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
71-43-2	Benzene	6	U
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	1	J
78-87-5	1,2-Dichloropropane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	15	U
108-88-3	Toluene	1	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-hexanone	15	U
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-1

Sample wt/vol: 4.83(g/mL) G Lab File ID: U2788-1B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 15 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropyl Benzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-Chloropropane	6	U
120-82-1	1,2,4-Trichlorobenzene	6	U
1330-20-7	Xylene (total)	2	J
79-20-9	Methyl acetate	6	U
110-82-7	Cyclohexane	6	U
108-87-2	Methylcyclohexane	1	J

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-1

Sample wt/vol: 4.83 (g/mL) G Lab File ID: U2788-1B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 15 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		BRANCHED ALKANE	16.93	9.67	J NJ
2.		STRAIGHT-CHAIN ALKANE	17.11	17.62	J
3.		BRANCHED ALKANE	17.22	6.72	J
4.	90-12-0	NAPHTHALENE, 1-METHYL-	17.30	17.88	NJ
5.		STRAIGHT-CHAIN ALKANE	17.75	21.59	J
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-2

Sample wt/vol: 5.15(g/mL) G Lab File ID: U2788-2B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 18 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	UUJ,C
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	6	UUJ,C
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	U
75-15-0	Carbon disulfide	0.6	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	6	U
67-64-1	Acetone	97	
75-09-2	Methylene Chloride	6	U
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl-tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-butanone	15	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
71-43-2	Benzene	6	U
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	1	J
78-87-5	1,2-Dichloropropane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	9	J
108-88-3	Toluene	1	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-hexanone	15	U
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-2

Sample wt/vol: 5.15(g/mL) G Lab File ID: U2788-2B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 18 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropyl Benzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-Chloropropane	6	U
120-82-1	1,2,4-Trichlorobenzene	6	U
1330-20-7	Xylene (total)	3	J
79-20-9	Methyl acetate	3	J
110-82-7	Cyclohexane	6	U
108-87-2	Methylcyclohexane	6	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
40SB13B

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-2

Sample wt/vol: 5.15 (g/mL) G Lab File ID: U2788-2B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 18 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-3

Sample wt/vol: 4.06(g/mL) G Lab File ID: U2788-3B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 18 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	U UJ,C
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	U UJ,C
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	1	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	8	U
67-64-1	Acetone	48	
75-09-2	Methylene Chloride	1	JB B,Z
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	19	U
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	8	U
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	1	J
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	19	U
108-88-3	Toluene	2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	19	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-3

Sample wt/vol: 4.06(g/mL) G Lab File ID: U2788-3B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 18 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	8	U
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	2	J
79-20-9	Methyl acetate	8	U
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	0.9	J

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-3

Sample wt/vol: 4.06 (g/mL) G Lab File ID: U2788-3B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 18 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-6

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-4

Sample wt/vol: 3.83 (g/mL) G Lab File ID: U2788-4B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 18 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uI

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	8	UUJ,C
74-87-3	Chloromethane	8	U
75-01-4	Vinyl Chloride	8	U
74-83-9	Bromomethane	8	UUJ,C
75-00-3	Chloroethane	8	U
75-69-4	Trichlorofluoromethane	8	U
75-35-4	1,1-Dichloroethene	8	U
75-15-0	Carbon disulfide	1	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	8	U
67-64-1	Acetone	20	J
75-09-2	Methylene Chloride	8	U
156-60-5	trans-1,2-Dichloroethene	8	U
1634-04-4	Methyl-tert-butyl ether	8	U
75-34-3	1,1-Dichloroethane	8	U
156-59-2	cis-1,2-Dichloroethene	8	U
78-93-3	2-butanone	20	U
67-66-3	Chloroform	8	U
71-55-6	1,1,1-Trichloroethane	8	U
56-23-5	Carbon Tetrachloride	8	U
71-43-2	Benzene	8	U
107-06-2	1,2-Dichloroethane	8	U
79-01-6	Trichloroethene	1	J
78-87-5	1,2-Dichloropropane	8	U
75-27-4	Bromodichloromethane	8	U
10061-01-5	cis-1,3-Dichloropropene	8	U
108-10-1	4-Methyl-2-pentanone	20	U
108-88-3	Toluene	1	JB B1Z
10061-02-6	trans-1,3-Dichloropropene	8	U
79-00-5	1,1,2-Trichloroethane	8	U
127-18-4	Tetrachloroethene	8	U
591-78-6	2-hexanone	20	U
124-48-1	Dibromochloromethane	8	U
106-93-4	1,2-Dibromoethane	8	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-6

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-4

Sample wt/vol: 3.83(g/mL) G Lab File ID: U2788-4B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 18 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	8	U
100-41-4	Ethylbenzene	8	U
100-42-5	Styrene	8	U
75-25-2	Bromoform	8	U
98-82-8	Isopropyl Benzene	8	U
79-34-5	1,1,2,2-Tetrachloroethane	8	U
541-73-1	1,3-Dichlorobenzene	8	U
106-46-7	1,4-Dichlorobenzene	8	U
95-50-1	1,2-Dichlorobenzene	8	U
96-12-8	1,2-Dibromo-3-Chloropropane	8	U
120-82-1	1,2,4-Trichlorobenzene	8	U
1330-20-7	Xylene (total)	24	U
79-20-9	Methyl acetate	8	U
110-82-7	Cyclohexane	8	U
108-87-2	Methylcyclohexane	8	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-6

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-4

Sample wt/vol: 3.83 (g/mL) G Lab File ID: U2788-4B59

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. 18 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 2.53 (g/mL) G Lab File ID: U2788-5B59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 22 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	13	U UJ,C
74-87-3	Chloromethane	13	U
75-01-4	Vinyl Chloride	13	U
74-83-9	Bromomethane	13	U UJ,C
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
75-15-0	Carbon disulfide	220	
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	910	
75-09-2	Methylene Chloride	8	JB
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl-tert-butyl ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	180	
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
56-23-5	Carbon Tetrachloride	13	U
71-43-2	Benzene	5	J
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	13	U
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	23	J
108-88-3	Toluene	9	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	13	U
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	32	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 2.53 (g/mL) G Lab File ID: U2788-5B59

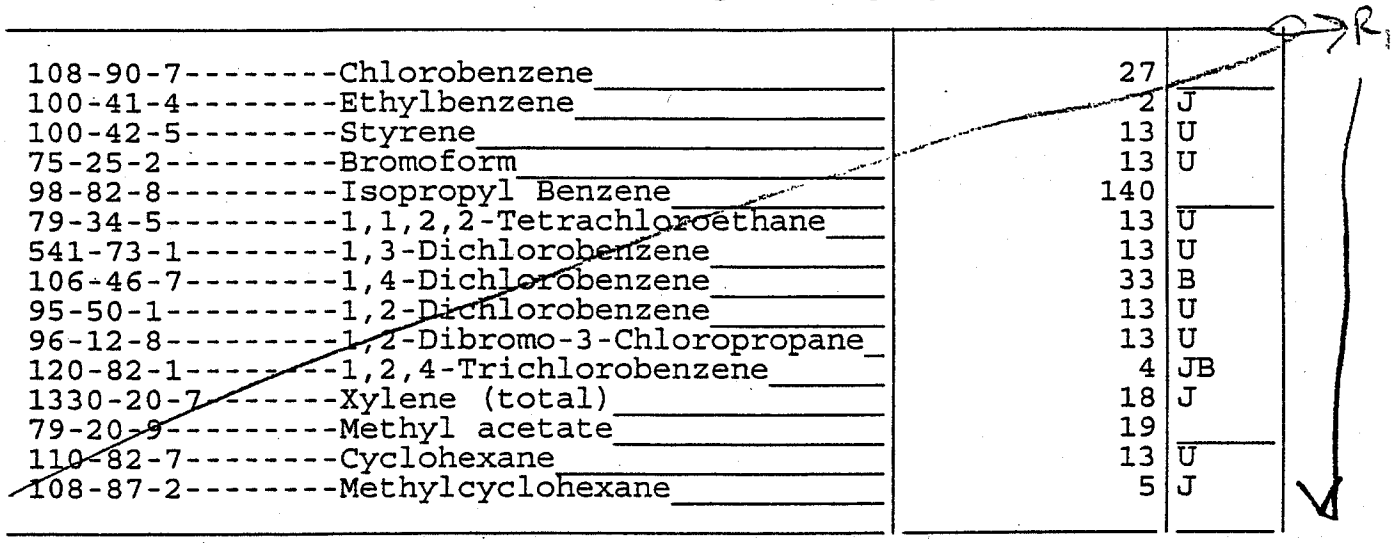
Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 22 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	27	
100-41-4	Ethylbenzene	2	J
100-42-5	Styrene	13	U
75-25-2	Bromoform	13	U
98-82-8	Isopropyl Benzene	140	
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	33	B
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-Chloropropane	13	U
120-82-1	1,2,4-Trichlorobenzene	4	JB
1330-20-7	Xylene (total)	18	J
79-20-9	Methyl acetate	19	
110-82-7	Cyclohexane	13	U
108-87-2	Methylcyclohexane	5	J



FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 2.53 (g/mL) G Lab File ID: U2788-5B59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 22 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		CYCLIC ALKANE	13.80	113.5	J NJ
2.		BRANCHED ALKANE	14.03	102.6	J
3.		CYCLIC ALKANE	14.31	228.9	J
4.	141-93-5	BENZENE, 1,3-DIETHYL-	14.60	100.7	NJ
5.		SUBSTITUTED BENZENE	14.67	98.55	J
6.	91-17-8	NAPHTHALENE, DECAHYDRO-	14.73	192.4	NJ
7.	135-01-3	BENZENE, 1,2-DIETHYL-	14.77	99.57	NJ
8.		SUBSTITUTED BENZENE	14.88	101.4	J
9.		SUBSTITUTED BENZENE	15.07	130.1	J
10.		SUBSTITUTED BENZENE	15.25	101.3	J
11.					
12.					
13.					
14.					
15.					
16.					
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 3.45(g/mL) G Lab File ID: U2788-5RA59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 22 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	9	U
74-87-3	Chloromethane	9	U
75-01-4	Vinyl Chloride	9	U
74-83-9	Bromomethane	9	UJ,C
75-00-3	Chloroethane	9	U
75-69-4	Trichlorofluoromethane	9	U
75-35-4	1,1-Dichloroethene	9	U
75-15-0	Carbon disulfide	49	J,C
76-13-1	1,1,2-trichloro-1,2,2-triflu	9	U
67-64-1	Acetone	280	
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	9	U
1634-04-4	Methyl-tert-butyl ether	9	U
75-34-3	1,1-Dichloroethane	9	U
156-59-2	cis-1,2-Dichloroethene	9	U
78-93-3	2-butanone	51	
67-66-3	Chloroform	9	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
71-43-2	Benzene	3	J
107-06-2	1,2-Dichloroethane	9	U
79-01-6	Trichloroethene	0.9	J
78-87-5	1,2-Dichloropropane	9	U
75-27-4	Bromodichloromethane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
108-10-1	4-Methyl-2-pentanone	17	J J,i
108-88-3	Toluene	4	JB B,i
10061-02-6	trans-1,3-Dichloropropene	9	UJ i
79-00-5	1,1,2-Trichloroethane	9	U
127-18-4	Tetrachloroethene	9	U
591-78-6	2-hexanone	23	U
124-48-1	Dibromochloromethane	9	U
106-93-4	1,2-Dibromoethane	9	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1FRE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 3.45(g/mL) G Lab File ID: U2788-5RA59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 22 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	12	J,i
100-41-4	Ethylbenzene	0.9	J↓
100-42-5	Styrene	9	U UJ,i
75-25-2	Bromoform	9	U↓
98-82-8	Isopropyl Benzene	55	J,i
79-34-5	1,1,2,2-Tetrachloroethane	9	U UJ,i
541-73-1	1,3-Dichlorobenzene	9	U↓
106-46-7	1,4-Dichlorobenzene	8	JB J,i
95-50-1	1,2-Dichlorobenzene	9	U UJ,i
96-12-8	1,2-Dibromo-3-Chloropropane	9	U
120-82-1	1,2,4-Trichlorobenzene	9	U↓ J,i
1330-20-7	Xylene (total)	7	J
79-20-9	Methyl acetate	9	U UJ,C
110-82-7	Cyclohexane	9	U UJ,i
108-87-2	Methylcyclohexane	2	J J,i

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT1FRE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 3.45 (g/mL) G Lab File ID: U2788-5RA59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 22 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		BRANCHED ALKANE	14.03	740.4	J NJ
2.		BRANCHED ALKANE	14.20	738.6	J
3.		CYCLIC ALKANE	14.32	1500	J
4.		BRANCHED ALKANE	14.45	1036	J
5.	91-17-8	NAPHTHALENE, DECAHYDRO-	14.73	1893	NJ
6.		CYCLIC ALKANE	14.79	719.3	J
7.		BRANCHED ALKANE	14.83	810.1	J
8.		CYCLIC ALKANE	14.88	891.3	J
9.		BRANCHED ALKANE	14.93	1016	J
10.		CYCLIC ALKANE	15.20	736.4	J
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FORM I VOA-TIC

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 4.92(g/mL) G Lab File ID: U2788-6B59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 30 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	7	U UJ,C
74-87-3	Chloromethane	7	U
75-01-4	Vinyl Chloride	7	U
74-83-9	Bromomethane	7	U UJ,C
75-00-3	Chloroethane	7	U
75-69-4	Trichlorofluoromethane	7	U
75-35-4	1,1-Dichloroethene	7	U
75-15-0	Carbon disulfide	13	
76-13-1	1,1,2-trichloro-1,2,2-triflu	7	U
67-64-1	Acetone	67	
75-09-2	Methylene Chloride	7	U
156-60-5	trans-1,2-Dichloroethene	7	U
1634-04-4	Methyl-tert-butyl ether	7	U
75-34-3	1,1-Dichloroethane	7	U
156-59-2	cis-1,2-Dichloroethene	7	U
78-93-3	2-butanone	18	U
67-66-3	Chloroform	7	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
71-43-2	Benzene	0.7	J
107-06-2	1,2-Dichloroethane	7	U
79-01-6	Trichloroethene	7	U
78-87-5	1,2-Dichloropropane	7	U
75-27-4	Bromodichloromethane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
108-10-1	4-Methyl-2-pentanone	18	U
108-88-3	Toluene	2	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	7	U
79-00-5	1,1,2-Trichloroethane	7	U
127-18-4	Tetrachloroethene	7	U
591-78-6	2-hexanone	18	U
124-48-1	Dibromochloromethane	7	U
106-93-4	1,2-Dibromoethane	7	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 4.92 (g/mL) G Lab File ID: U2788-6B59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 30 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	7	U
100-42-5	Styrene	7	U
75-25-2	Bromoform	7	U
98-82-8	Isopropyl Benzene	2	J
79-34-5	1,1,2,2-Tetrachloroethane	7	U
541-73-1	1,3-Dichlorobenzene	7	U
106-46-7	1,4-Dichlorobenzene	0.6	JB
95-50-1	1,2-Dichlorobenzene	7	U
96-12-8	1,2-Dibromo-3-Chloropropane	7	U
120-82-1	1,2,4-Trichlorobenzene	7	U
1330-20-7	Xylene (total)	6	J
79-20-9	Methyl acetate	7	U
110-82-7	Cyclohexane	3	J
108-87-2	Methylcyclohexane	4	J

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 4.92 (g/mL) G Lab File ID: U2788-6B59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 30 Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		BRANCHED ALKANE	14.03	18.98	J NJ
2.		BRANCHED ALKANE	14.27	16.81	J
3.		CYCLIC ALKANE	14.32	41.77	J
4.	493-02-7	NAPHTHALENE, DECAHYDRO-, TRA	14.73	42.92	NJ
5.		BRANCHED ALKANE	14.82	24.32	J
6.		SUBSTITUTED BENZENE	14.88	33.15	J
7.		BRANCHED ALKANE	14.92	26.60	J
8.		CYCLIC ALKANE	15.19	19.15	J
9.		SUBSTITUTED BENZENE	15.26	20.29	J
10.		BRANCHED ALKANE	15.27	23.67	J
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30.					

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F2RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 2.15(g/mL) G Lab File ID: U2788-6RA59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 30 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	17	U
74-87-3	Chloromethane	17	U
75-01-4	Vinyl Chloride	17	U
74-83-9	Bromomethane	17	U UJ,C
75-00-3	Chloroethane	17	U
75-69-4	Trichlorofluoromethane	17	U
75-35-4	1,1-Dichloroethene	17	U
75-15-0	Carbon disulfide	20	J,C
76-13-1	1,1,2-trichloro-1,2,2-triflu	17	U
67-64-1	Acetone	140	
75-09-2	Methylene Chloride	17	U
156-60-5	trans-1,2-Dichloroethene	17	U
1634-04-4	Methyl-tert-butyl ether	17	U
75-34-3	1,1-Dichloroethane	17	U
156-59-2	cis-1,2-Dichloroethene	17	U
78-93-3	2-butanone	42	U
67-66-3	Chloroform	17	U
71-55-6	1,1,1-Trichloroethane	17	U
56-23-5	Carbon Tetrachloride	17	U
71-43-2	Benzene	1	J
107-06-2	1,2-Dichloroethane	17	U
79-01-6	Trichloroethene	17	U
78-87-5	1,2-Dichloropropane	17	U
75-27-4	Bromodichloromethane	17	U
10061-01-5	cis-1,3-Dichloropropene	17	U
108-10-1	4-Methyl-2-pentanone	42	U
108-88-3	Toluene	6	JB B,Z
10061-02-6	trans-1,3-Dichloropropene	17	U
79-00-5	1,1,2-Trichloroethane	17	U
127-18-4	Tetrachloroethene	17	U
591-78-6	2-hexanone	42	U
124-48-1	Dibromochloromethane	17	U
106-93-4	1,2-Dibromoethane	17	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F2RE

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 2.15(g/mL) G Lab File ID: U2788-6RA59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 30 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	2	J
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	17	U
75-25-2	Bromoform	17	U
98-82-8	Isopropyl Benzene	9	J
79-34-5	1,1,2,2-Tetrachloroethane	17	U UJ
541-73-1	1,3-Dichlorobenzene	17	U
106-46-7	1,4-Dichlorobenzene	3	JB J
95-50-1	1,2-Dichlorobenzene	17	U UJ
96-12-8	1,2-Dibromo-3-Chloropropane	17	U
120-82-1	1,2,4-Trichlorobenzene	17	U
1330-20-7	Xylene (total)	15	J
79-20-9	Methyl acetate	12	J J,C
110-82-7	Cyclohexane	17	U
108-87-2	Methylcyclohexane	2	J

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT1F2RE

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 2.15 (g/mL) G Lab File ID: U2788-6RA59

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. 30 Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uI

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		BRANCHED ALKANE	14.03	66.88	J NJ, t
2.		CYCLIC ALKANE	14.33	147.9	J
3.	91-17-8	NAPHTHALENE, DECAHYDRO-	14.73	145.8	NJ
4.		BRANCHED ALKANE	14.83	61.33	J
5.		SUBSTITUTED BENZENE	14.89	91.47	J
6.	1758-88-9	BENZENE, 2-ETHYL-1,4-DIMETHY	14.95	85.38	NJ
7.		SUBSTITUTED BENZENE	15.08	71.92	J
8.		CYCLIC ALKANE	15.20	60.74	J
9.		SUBSTITUTED BENZENE	15.26	74.98	J
10.		UNKNOWN ALKANE	15.57	67.63	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-1B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-1B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	780	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U R/C
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	390	U
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-1B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.71	1200	JB
2.	10544-50-0	SULFUR, MOL. (S8)	14.19	540	NJ
3.		~~UNKNOWN~~	17.52	180	JC
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-2B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-2B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R1C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-2B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 13

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.42	470	JB
2.		~~UNKNOWN (BC)~~	5.71	960	JB
3.	57-10-3	HEXADECANOIC ACID	12.87	310	NJ
4.	10544-50-0	SULFUR, MOL. (S8)	14.22	2100	NJ
5.		~~UNKNOWN~~	17.52	230	J
6.	295-17-0	CYCLOTETRADECANE	18.96	250	NJ
7.		~~UNKNOWN ALCOHOL~~	19.16	230	J
8.		~~UNKNOWN~~	19.38	220	J
9.		~~UNKNOWN~~	19.70	220	J
10.		~~STRAIGHT-CHAIN ALKANE~~	20.02	250	J
11.		~~UNKNOWN ALCOHOL~~	22.22	610	J
12.		~~UNKNOWN~~	24.13	800	J
13.		~~UNKNOWN~~	24.44	800	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-3B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-3B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

RIC

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-3B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.42~~	~~500~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.71~~	~~1100~~	~~JB~~
3.	10544-50-0	SULFUR, MOL. (S8)	14.20	310	NJ NJ
4.		~~UNKNOWN~~	~~17.52~~	~~160~~	~~J~~
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-6

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-4B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-6

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-4B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	78	J
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U RIC
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-6

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-4B64

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.42~~	~~460~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.71~~	~~1100~~	~~JB~~
3.	7704-34-9	SULFUR	14.20	1300	NJ
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-5J2A64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 22 decanted: (Y/N) N Date Extracted: 11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	120	J J,Y
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	68	J
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	65	J
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	82	J
91-57-6	2-Methylnaphthalene	91	J
77-47-4	Hexachlorocyclopentadiene	420	U UJ,C
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	44	J
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	850	U
131-11-3	Dimethylphthalate	95	J
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	850	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-5J2A64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 22 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U UJ,C
100-02-7	4-Nitrophenol	850	U UJ,C
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	120	J
7005-72-3	4-Chlorophenyl-phenylether	420	U UJ,C
86-73-7	Fluorene	85	J
100-01-6	4-Nitroaniline	850	U
534-52-1	4,6-Dinitro-2-methylphenol	850	U
86-30-6	N-Nitrosodiphenylamine (1)	420	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	U UJ,C
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	130	J
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	140	J
206-44-0	Fluoranthene	70	J
129-00-0	Pyrene	77	J
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	1500	
56-55-3	Benzo(a)anthracene	420	U
218-01-9	Chrysene	420	U
117-84-0	Di-n-octylphthalate	48	J
205-99-2	Benzo(b)fluoranthene	420	U
207-08-9	Benzo(k)fluoranthene	420	U
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	420	U
53-70-3	Dibenzo(a,h)anthracene	420	U UJ,C
191-24-2	Benzo(g,h,i)perylene	420	U ↓

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-5J2A64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 22 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	12.41	2700	J
2.	10544-50-0	SULFUR, MOL. (S8)	14.25	18000	NJ
3.		UNKNOWN	14.56	1600	J
4.		UNKNOWN	14.64	2700	J
5.		STRAIGHT-CHAIN ALKANE	15.38	5200	J
6.		UNKNOWN	15.50	4100	J
7.		STRAIGHT-CHAIN ALKANE	16.25	7300	J
8.		STRAIGHT-CHAIN ALKANE	17.03	9800	J
9.		UNKNOWN	17.50	1700	J
10.		UNKNOWN	18.16	1600	J
11.		UNKNOWN	18.24	2300	J
12.		STRAIGHT-CHAIN ALKANE	18.34	9700	J
13.		STRAIGHT-CHAIN ALKANE	18.72	1200	J
14.		STRAIGHT-CHAIN ALKANE	18.94	8900	J
15.		UNKNOWN ALKANE	20.37	2400	J
16.		STRAIGHT-CHAIN ALKANE	20.49	4500	J
17.		STRAIGHT-CHAIN ALKANE	20.97	2800	J
18.		UNKNOWN	21.29	4200	J
19.		UNKNOWN ALKANE	21.42	2800	J
20.		UNKNOWN	22.20	1400	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-6B64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	470	U
108-95-2	Phenol	470	U
111-44-4	Bis(2-chloroethyl)ether	470	U
95-57-8	2-Chlorophenol	470	U
95-48-7	2-Methylphenol	470	U
108-60-1	2,2'-oxybis(1-Chloropropane)	470	U
98-86-2	Acetophenone	470	U
106-44-5	4-Methylphenol	470	U
621-64-7	N-Nitroso-di-N-propylamine	470	U
67-72-1	Hexachloroethane	470	U
98-95-3	Nitrobenzene	470	U
78-59-1	Isophorone	470	U
88-75-5	2-Nitrophenol	470	U
105-67-9	2,4-Dimethylphenol	470	U
111-91-1	Bis(2-chloroethoxy)methane	470	U
120-83-2	2,4-Dichlorophenol	470	U
91-20-3	Naphthalene	140	J
106-47-8	4-Chloroaniline	470	U
87-68-3	Hexachlorobutadiene	470	U
105-60-2	Caprolactam	470	U
59-50-7	4-Chloro-3-methylphenol	470	U
91-57-6	2-Methylnaphthalene	110	J
77-47-4	Hexachlorocyclopentadiene	470	U
88-06-2	2,4,6-Trichlorophenol	470	U
95-95-4	2,4,5-Trichlorophenol	470	U
92-52-4	1,1'-Biphenyl	54	J
91-58-7	2-Chloronaphthalene	470	U
88-74-4	2-Nitroaniline	940	U
131-11-3	Dimethylphthalate	470	U
606-20-2	2,6-Dinitrotoluene	470	U
208-96-8	Acenaphthylene	470	U
99-09-2	3-Nitroaniline	940	U
83-32-9	Acenaphthene	470	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-6B64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 30 decanted: (Y/N) N Date Extracted: 11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2400	U
100-02-7	4-Nitrophenol	940	U
121-14-2	2,4-Dinitrotoluene	470	U
132-64-9	Dibenzofuran	470	U
84-66-2	Diethylphthalate	72	J
7005-72-3	4-Chlorophenyl-phenylether	470	U
86-73-7	Fluorene	470	U
100-01-6	4-Nitroaniline	940	U
534-52-1	4,6-Dinitro-2-methylphenol	940	U
86-30-6	N-Nitrosodiphenylamine (1)	590	JIR
101-55-3	4-Bromophenyl-phenylether	470	U
118-74-1	Hexachlorobenzene	Do NOT 470	U RICR
~~1912-24-9~~	~~Atrazine~~	470	U
87-86-5	Pentachlorophenol	use 470	U
85-01-8	Phenanthrene	230	J
120-12-7	Anthracene	RA 470	U
86-74-8	Carbazole	470	U
84-74-2	Di-n-butylphthalate	310	J
206-44-0	Fluoranthene	130	J
129-00-0	Pyrene	170	J
85-68-7	Butylbenzylphthalate	470	U
91-94-1	3,3'-Dichlorobenzidine	470	U
117-81-7	bis(2-ethylhexyl)Phthalate	1400	
56-55-3	Benzo(a)anthracene	46	J
218-01-9	Chrysene	69	J
~~117-84-0~~	~~Di-n-octylphthalate~~	470	U JJ'i
205-99-2	Benzo(b)fluoranthene	470	U
207-08-9	Benzo(k)fluoranthene	470	U
50-32-8	Benzo(a)pyrene	470	U WJi
193-39-5	Indeno(1,2,3-cd)pyrene	470	U
53-70-3	Dibenzo(a,h)anthracene	470	U
191-24-2	Benzo(g,h,i)perylene	Do not 40	J JJi

(1) - Cannot be separated from Diphenylamine

use this one RA 2/1/03

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-6B64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/30/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	10544-50-0	SULFUR, MOL. (S8)	14.31	9700	NJ
2.		UNKNOWN	14.70	2400	J
3.	7396-38-5	PHENANTHRENE, 2,4,5,7-TETRAM	15.83	2300	NJ
4.		BRANCHED ALKANE	16.30	3600	J
5.		BRANCHED ALKANE	17.08	7200	J
6.		BRANCHED ALKANE	17.79	13000	J
7.		UNKNOWN CARBOXYLIC ACID	18.05	7800	J
8.		STRAIGHT-CHAIN ALKANE	18.43	20000	J
9.		BRANCHED ALKANE	18.77	3200	J
10.		STRAIGHT-CHAIN ALKANE	19.01	25000	J
11.		STRAIGHT-CHAIN ALKANE	19.35	1900	J
12.		STRAIGHT-CHAIN ALKANE	20.08	18000	J
13.		STRAIGHT-CHAIN ALKANE	20.38	2200	J
14.		UNKNOWN	20.43	5100	J
15.		STRAIGHT-CHAIN ALKANE	20.57	13000	J
16.		UNKNOWN ALKANE	20.90	2700	J
17.		BRANCHED ALKANE	21.04	9400	J
18.		UNKNOWN	21.11	2800	J
19.		STRAIGHT-CHAIN ALKANE	21.48	6200	J
20.		UNKNOWN	21.66	2400	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F2DL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-6DA64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	940	U
108-95-2	Phenol	940	U
111-44-4	Bis(2-chloroethyl)ether	940	U
95-57-8	2-Chlorophenol	940	U
95-48-7	2-Methylphenol	940	U
108-60-1	2,2'-oxybis(1-Chloropropane)	940	U
98-86-2	Acetophenone	940	U
106-44-5	4-Methylphenol	940	U
621-64-7	N-Nitroso-di-N-propylamine	940	U
67-72-1	Hexachloroethane	940	U
98-95-3	Nitrobenzene	940	U
78-59-1	Isophorone	940	U
88-75-5	2-Nitrophenol	940	U
105-67-9	2,4-Dimethylphenol	940	U
111-91-1	Bis(2-chloroethoxy)methane	940	U
120-83-2	2,4-Dichlorophenol	940	U
91-20-3	Naphthalene	190	DJ
106-47-8	4-Chloroaniline	940	U
87-68-3	Hexachlorobutadiene	940	U
105-60-2	Caprolactam	940	U
59-50-7	4-Chloro-3-methylphenol	940	U
91-57-6	2-Methylnaphthalene	160	DJ
77-47-4	Hexachlorocyclopentadiene	940	UUJ,C
88-06-2	2,4,6-Trichlorophenol	940	U
95-95-4	2,4,5-Trichlorophenol	940	U
92-52-4	1,1'-Biphenyl	110	DJ
91-58-7	2-Chloronaphthalene	940	U
88-74-4	2-Nitroaniline	1900	U
131-11-3	Dimethylphthalate	940	U
606-20-2	2,6-Dinitrotoluene	940	U
208-96-8	Acenaphthylene	940	U
99-09-2	3-Nitroaniline	1900	U
83-32-9	Acenaphthene	940	U

DO NOT USE RX 2/11/03

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TESTPIT1F2DL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-6DA64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 30 decanted: (Y/N) N Date Extracted: 11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	4700	U UJ,C
100-02-7	4-Nitrophenol	1900	U UJ,C
121-14-2	2,4-Dinitrotoluene	940	U
132-64-9	Dibenzofuran	940	U
84-66-2	Diethylphthalate	170	DJ
7005-72-3	4-Chlorophenyl-phenylether	940	U UJ,C
86-73-7	Fluorene	110	DJ
100-01-6	4-Nitroaniline	1900	U
534-52-1	4,6-Dinitro-2-methylphenol	1900	U
86-30-6	N-Nitrosodiphenylamine (1)	1000	DJ,R
101-55-3	4-Bromophenyl-phenylether	940	U
118-74-1	Hexachlorobenzene	940	U
1912-24-9	Atrazine	940	U UJ,R
87-86-5	Pentachlorophenol	940	U
85-01-8	Phenanthrene	340	DJ
120-12-7	Anthracene	940	U
86-74-8	Carbazole	940	U
84-74-2	Di-n-butylphthalate	530	DJ
206-44-0	Fluoranthene	180	DJ
129-00-0	Pyrene	260	DJ
85-68-7	Butylbenzylphthalate	940	U
91-94-1	3,3'-Dichlorobenzidine	940	U
117-81-7	bis(2-ethylhexyl)Phthalate	2700	D
56-55-3	Benzo(a)anthracene	940	U
218-01-9	Chrysene	100	DJ
117-84-0	Di-n-octylphthalate	940	U
205-99-2	Benzo(b)fluoranthene	940	U
207-08-9	Benzo(k)fluoranthene	940	U
50-32-8	Benzo(a)pyrene	940	U
193-39-5	Indeno(1,2,3-cd)pyrene	940	U
53-70-3	Dibenzo(a,h)anthracene	940	U UJ,C
191-24-2	Benzo(g,h,i)perylene	68	DJ UJ,C

use this EA

use this one

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TESTPIT1F2DL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2788-6DA64

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/22/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/03/02

Injection Volume: 1.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	10544-50-0	SULFUR, MOL. (S8)	14.21	15000	NJD
2.		UNKNOWN	14.63	3600	JD
3.		STRAIGHT-CHAIN ALKANE	15.37	3300	JD
4.		BRANCHED ALKANE	15.69	3600	JD
5.		UNKNOWN PAH	15.74	3900	JD
6.		STRAIGHT-CHAIN ALKANE	16.25	8400	JD
7.		BRANCHED ALKANE	17.01	14000	JD
8.		UNKNOWN ALKANE	17.17	3200	JD
9.		UNKNOWN CARBOXYLIC ACID	17.99	12000	JD
10.		STRAIGHT-CHAIN ALKANE	18.37	22000	JD
11.		UNKNOWN ALKANE	18.69	4200	JD
12.		BRANCHED ALKANE	18.72	4000	JD
13.		STRAIGHT-CHAIN ALKANE	18.94	25000	JD
14.		STRAIGHT-CHAIN ALKANE	20.51	14000	JD
15.		UNKNOWN	20.85	3300	JD
16.		BRANCHED ALKANE	20.97	6900	JD
17.		STRAIGHT-CHAIN ALKANE	21.43	6800	JD
18.		UNKNOWN CYCLOALKANE	21.61	2900	JD
19.		UNKNOWN	22.24	7100	JD
20.		UNKNOWN	22.41	6400	JD
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

FORM I SV-TIC

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/22/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.98	U
319-84-6	alpha-BHC	0.98	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	0.98	U
58-89-9	gamma-BHC (Lindane)	0.98	U
72-54-8	4,4'-DDD	3.9	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	5.9	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
72-20-8	Endrin	3.9	U
7421-93-4	Endrin Aldehyde	3.9	U
76-44-8	Heptachlor	0.98	U
1024-57-3	Heptachlor Epoxide	0.98	U
72-43-5	Methoxychlor	9.8	U
8001-35-2	Toxaphene	98	U
12674-11-2	Aroclor-1016	76	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	76	U
53469-21-9	Aroclor-1242	53	U
12672-29-6	Aroclor-1248	53	U
11097-69-1	Aroclor-1254	59	
11096-82-5	Aroclor-1260	76	U
53494-70-5	Endrin Ketone	9.8	U
5103-74-2	gamma-Chlordane	0.98	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 22 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/17/02

Injection Volume: 2.0(uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	21	U
319-84-6	alpha-BHC	21	U
319-85-7	beta-BHC	44	U
319-86-8	delta-BHC	21	U
58-89-9	gamma-BHC (Lindane)	21	U
72-54-8	4,4'-DDD	85	U
72-55-9	4,4'-DDE	44	U
50-29-3	4,4'-DDT	130	U
60-57-1	Dieldrin	44	U
959-98-8	Endosulfan I	44	U
33213-65-9	Endosulfan II	85	U
1031-07-8	Endosulfan sulfate	64	J
72-20-8	Endrin	85	U
7421-93-4	Endrin Aldehyde	85	U
76-44-8	Heptachlor	21	U
1024-57-3	Heptachlor Epoxide	21	U
72-43-5	Methoxychlor	210	U
8001-35-2	Toxaphene	2100	U
12674-11-2	Aroclor-1016	1700	U
11104-28-2	Aroclor-1221	2200	U
11141-16-5	Aroclor-1232	1700	U
53469-21-9	Aroclor-1242	1200	U
12672-29-6	Aroclor-1248	1200	U
11097-69-1	Aroclor-1254	3600	
11096-82-5	Aroclor-1260	1700	U
53494-70-5	Endrin Ketone	210	U
5103-74-2	gamma-Chlordane	21	U
5103-71-9	alpha-Chlordane	44	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 30 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/25/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.2	U UL,S
319-84-6	alpha-BHC	1.9	L,S
319-85-7	beta-BHC	3.8	↓
319-86-8	delta-BHC	1.2	U UL,S
58-89-9	gamma-BHC (Lindane)	1.2	U
72-54-8	4,4'-DDD	4.7	U
72-55-9	4,4'-DDE	2.4	U
50-29-3	4,4'-DDT	7.1	U
60-57-1	Dieldrin	2.4	U
959-98-8	Endosulfan I	2.4	U
33213-65-9	Endosulfan II	4.7	U
1031-07-8	Endosulfan sulfate	4.7	U
72-20-8	Endrin	4.7	U
7421-93-4	Endrin Aldehyde	4.7	U
76-44-8	Heptachlor	1.2	U
1024-57-3	Heptachlor Epoxide	1.2	U
72-43-5	Methoxychlor	12	U UL,S
8001-35-2	Toxaphene	120	U UL,S
12674-11-2	Aroclor-1016	93	U
11104-28-2	Aroclor-1221	120	U
11141-16-5	Aroclor-1232	93	U
53469-21-9	Aroclor-1242	64	U
12672-29-6	Aroclor-1248	64	U
11097-69-1	Aroclor-1254	460	L,S
11096-82-5	Aroclor-1260	190	↓
53494-70-5	Endrin Ketone	12	U UL,S
5103-74-2	gamma-Chlordane	1.2	U
5103-71-9	alpha-Chlordane	4.4	L,S

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/27/02

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	79	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	79	U
53469-21-9	Aroclor-1242	55	U
12672-29-6	Aroclor-1248	55	U
11097-69-1	Aroclor-1254	55	U
11096-82-5	Aroclor-1260	660	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/22/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	40	U
11104-28-2	Aroclor-1221	52	U
11141-16-5	Aroclor-1232	40	U
53469-21-9	Aroclor-1242	27	U
12672-29-6	Aroclor-1248	27	U
11097-69-1	Aroclor-1254	27	U
11096-82-5	Aroclor-1260	40	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-6

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/20/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 11/22/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	40	U
11104-28-2	Aroclor-1221	52	U
11141-16-5	Aroclor-1232	40	U
53469-21-9	Aroclor-1242	27	U
12672-29-6	Aroclor-1248	27	U
11097-69-1	Aroclor-1254	27	U
11096-82-5	Aroclor-1260	40	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/20/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	85	JPZ J,g
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	64	P J,g
218-01-9	Chrysene	310	PZ
205-99-2	Benzo(b)fluoranthene	25	JZ
207-08-9	Benzo(k)fluoranthene	9.8	U
53-70-3	Dibenzo(a,h)anthracene	9.8	U
191-24-2	Benzo(g,h,i)perylene	9.8	U
56-55-3	Benzo(a)anthracene	9.8	U
50-32-8	Benzo(a)pyrene	22	P J,q
193-39-5	Indeno(1,2,3-cd)pyrene	9.8	U
208-96-8	Acenaphthylene	49	U

Z (Results reported from five fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/20/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	92	JPZ J,g
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	62	P
218-01-9	Chrysene	550	PZ J,g
205-99-2	Benzo(b)fluoranthene	35	JPZ
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	33	P J,g
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

Z (Results reported from five fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/20/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	380	PZ J, g
86-73-7	Fluorene	51	U
129-00-0	Pyrene	430	E J, g
85-01-8	Phenanthrene	420	
120-12-7	Anthracene	130	JZ
206-44-0	Fluoranthene	800	E J, g
218-01-9	Chrysene	390	PZ J, g
205-99-2	Benzo(b)fluoranthene	140	P
207-08-9	Benzo(k)fluoranthene	160	P
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	60	
56-55-3	Benzo(a)anthracene	170	Z
50-32-8	Benzo(a)pyrene	100	
193-39-5	Indeno(1,2,3-cd)pyrene	550	EP J, g
208-96-8	Acenaphthylene	260	U

Z (Results reported from five fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-6

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/20/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/08/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	8.6	J
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	22	
218-01-9	Chrysene	140	P J,g
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	2.5	J
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	5.4	JP J,g
50-32-8	Benzo(a)pyrene	8.0	J
193-39-5	Indeno(1,2,3-cd)pyrene	240	EP J,g
208-96-8	Acenaphthylene	51	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 22 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/25/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	54	U
83-32-9	Acenaphthene	54	U
86-73-7	Fluorene	54	U
129-00-0	Pyrene	650	JPZ J,g
85-01-8	Phenanthrene	54	U
120-12-7	Anthracene	54	U
206-44-0	Fluoranthene	990	EP J,g
218-01-9	Chrysene	2800	PZ ↓
205-99-2	Benzo(b)fluoranthene	330	JPZ
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	4100	PZ J,g

Z (Results reported from fifty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 30 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:11/25/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/13/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	420	JPZJ,g
83-32-9	Acenaphthene	60	U
86-73-7	Fluorene	60	U
129-00-0	Pyrene	170	JPZ J,g
85-01-8	Phenanthrene	60	U
120-12-7	Anthracene	60	U
206-44-0	Fluoranthene	490	EP J,g
218-01-9	Chrysene	2600	PZ ↓J
205-99-2	Benzo(b)fluoranthene	12	U
207-08-9	Benzo(k)fluoranthene	12	U
53-70-3	Dibenzo(a,h)anthracene	12	U
191-24-2	Benzo(g,h,i)perylene	12	U
56-55-3	Benzo(a)anthracene	1200	PZ J,g
50-32-8	Benzo(a)pyrene	12	U
193-39-5	Indeno(1,2,3-cd)pyrene	12	U
208-96-8	Acenaphthylene	980	JPZJ,g

Z (Results reported from twenty fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	UJ,r
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	
479-45-8	Tetryl	2.0	U	
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

UJ, r

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

UJ, r

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-6

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	UJ,r
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	
479-45-8	Tetryl	2.0	U	
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/26/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

UJ, r

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/26/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/04/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
2691-41-0	HMX	1.0	U	
99-35-4	1,3,5-Trinitrobenzene	1.0	U	
121-82-4	RDX	1.0	U	UJ,r
99-65-0	1,3-Dinitrobenzene	1.0	U	
118-96-7	2,4,6-Trinitrotoluene	1.0	U	
479-45-8	Tetryl	2.0	U	
98-95-3	Nitrobenzene	1.0	U	
121-14-2	2,4-Dinitrotoluene	1.0	U	
606-20-2	2,6-Dinitrotoluene	1.0	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U	
88-72-2	2-Nitrotoluene	1.0	U	
99-99-0	4-Nitrotoluene	1.0	U	
99-08-1	3-Nitrotoluene	1.0	U	

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-6

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/20/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/21/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 11/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/26/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/08/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
55-63-0	Nitroglycerin	130	P	J,g

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: U2788-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 11/21/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:11/26/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/08/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: U2788

Matrix (soil/water): SOIL Lab Sample ID: U2788-1

Level (low/med): LOW Date Received: 11/20/02

% Solids: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12200			P	
7440-36-0	Antimony	0.44	U	N	P	~~UL/W~~ R/M
7440-38-2	Arsenic	2.8		N	P	L/O
7440-39-3	Barium	37.7			P	
7440-41-7	Beryllium	0.34	B		P	
7440-43-9	Cadmium	0.05	U		P	C/A
7440-70-2	Calcium	4100		*	P	
7440-47-3	Chromium	18.2			P	
7440-48-4	Cobalt	6.1			P	
7440-50-8	Copper	2.6		*	P	J/K
7439-89-6	Iron	23000			P	
7439-92-1	Lead	15.0			P	
7439-95-4	Magnesium	2280		*	P	
7439-96-5	Manganese	266			P	
7439-97-6	Mercury	0.046			CV	
7440-02-0	Nickel	4.8			P	
7440-09-7	Potassium	579			P	
7782-49-2	Selenium	1.6		N	P	L/M
7440-22-4	Silver	0.12	B		P	
7440-23-5	Sodium	124	B		P	~~L/W~~ B, X
7440-28-0	Thallium	0.60	U	N	P	~~UL/W~~ R/M
7440-62-2	Vanadium	40.7		N	P	K/M
7440-66-6	Zinc	18.9		*E	P	J/K

Color Before: BROWN Clarity Before: _____ Texture: COARSE

Color After: YELLOW Clarity After: _____ Artifacts: _____

Comments: _____

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix (soil/water): SOIL Lab Sample ID: U2788-2

Level (low/med): LOW Date Received: 11/20/02

% Solids: 82.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	20100			P	
7440-36-0	Antimony	0.45	U	N	P	~~L,W~~ R,M
7440-38-2	Arsenic	3.0		N	P	L,O
7440-39-3	Barium	61.7			P	
7440-41-7	Beryllium	0.81			P	
7440-43-9	Cadmium	0.14	B		P	K,W
7440-70-2	Calcium	3340		*	P	
7440-47-3	Chromium	27.6			P	
7440-48-4	Cobalt	7.4			P	
7440-50-8	Copper	13.5		*	P	J,K
7439-89-6	Iron	25300			P	
7439-92-1	Lead	23.3			P	
7439-95-4	Magnesium	8440		*	P	
7439-96-5	Manganese	304			P	
7439-97-6	Mercury	0.081			CV	
7440-02-0	Nickel	11.8			P	
7440-09-7	Potassium	1780			P	
7782-49-2	Selenium	1.7		N	P	L,M
7440-22-4	Silver	0.11	B		P	
7440-23-5	Sodium	166	B		P	~~L,W~~ B,Z
7440-28-0	Thallium	0.61	U	N	P	~~L,W~~ R,M
7440-62-2	Vanadium	48.0		N	P	K,M
7440-66-6	Zinc	56.7		*E	P	J,K

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix (soil/water): SOIL Lab Sample ID: U2788-3

Level (low/med): LOW Date Received: 11/20/02

% Solids: 81.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15000			P	
7440-36-0	Antimony	0.44	U	N	P	~~UL~~ R,M
7440-38-2	Arsenic	4.7		N	P	L,O
7440-39-3	Barium	47.0			P	
7440-41-7	Beryllium	0.55	B		P	
7440-43-9	Cadmium	0.15	B		P	K,W
7440-70-2	Calcium	33400		*E	P	
7440-47-3	Chromium	27.6			P	
7440-48-4	Cobalt	6.6			P	
7440-50-8	Copper	7.5		*	P	J,K
7439-89-6	Iron	23600			P	
7439-92-1	Lead	16.8			P	
7439-95-4	Magnesium	9760		*E	P	
7439-96-5	Manganese	180			P	
7439-97-6	Mercury	0.063			CV	
7440-02-0	Nickel	7.3			P	
7440-09-7	Potassium	1840			P	
7782-49-2	Selenium	3.4		N	P	L,M
7440-22-4	Silver	0.16	B		P	
7440-23-5	Sodium	126	B		P	~~L~~ B,X
7440-28-0	Thallium	0.61	U	N	P	~~UL~~ R,M
7440-62-2	Vanadium	46.0		N	P	K,M
7440-66-6	Zinc	27.7		*E	P	J,K

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-6

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix (soil/water): SOIL Lab Sample ID: U2788-4

Level (low/med): LOW Date Received: 11/20/02

% Solids: 82.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	22700			P	
7440-36-0	Antimony	0.44	U	N	P	~~UL~~ R,M
7440-38-2	Arsenic	2.2		N	P	L,O
7440-39-3	Barium	44.8			P	
7440-41-7	Beryllium	1.0			P	
7440-43-9	Cadmium	0.21	B		P	K,W
7440-70-2	Calcium	61800		*	P	
7440-47-3	Chromium	29.8			P	
7440-48-4	Cobalt	43.1			P	
7440-50-8	Copper	7.5		*	P	J,K
7439-89-6	Iron	25600			P	
7439-92-1	Lead	15.4			P	
7439-95-4	Magnesium	27600		*	P	
7439-96-5	Manganese	791			P	
7439-97-6	Mercury	0.027	B		CV	
7440-02-0	Nickel	74.9			P	
7440-09-7	Potassium	5600			P	
7782-49-2	Selenium	0.70		N	P	K,W
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	174	B		P	~~L~~ B,X
7440-28-0	Thallium	0.60	U	N	P	~~UL~~ R,M
7440-62-2	Vanadium	59.1		N	P	K,M
7440-66-6	Zinc	44.4		*E	P	J,K

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: U2788

Matrix (soil/water): SOIL Lab Sample ID: U2788-5

Level (low/med): LOW Date Received: 11/21/02

% Solids: 77.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13200			P	
7440-36-0	Antimony	0.76	B	N	P	L,W
7440-38-2	Arsenic	5.1		N	P	L,O
7440-39-3	Barium	84.5			P	
7440-41-7	Beryllium	0.59	B		P	
7440-43-9	Cadmium	1.2			P	K,W
7440-70-2	Calcium	19900		*	P	
7440-47-3	Chromium	31.4			P	
7440-48-4	Cobalt	8.0			P	
7440-50-8	Copper	53.2		*	P	J,K
7439-89-6	Iron	27400			P	
7439-92-1	Lead	158			P	
7439-95-4	Magnesium	11600		*	P	
7439-96-5	Manganese	538			P	
7439-97-6	Mercury	0.85			CV	
7440-02-0	Nickel	16.4			P	
7440-09-7	Potassium	1360			P	
7782-49-2	Selenium	1.9		N	P	L,M
7440-22-4	Silver	0.34	B		P	
7440-23-5	Sodium	374			P	~~L,W~~ B, X
7440-28-0	Thallium	0.63	U	N	P	~~U,W~~ R,M
7440-62-2	Vanadium	38.5		N	P	K,M
7440-66-6	Zinc	158		*E	P	J,K

Color Before: BROWN Clarity Before: _____ Texture: COARSE

Color After: YELLOW Clarity After: _____ Artifacts: _____

Comments: _____

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix (soil/water): SOIL Lab Sample ID: U2788-6

Level (low/med): LOW Date Received: 11/21/02

% Solids: 70.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11000			P	
7440-36-0	Antimony	0.52	U	N	P	UL,W RyM L10
7440-38-2	Arsenic	11.8		N	P	
7440-39-3	Barium	102			P	
7440-41-7	Beryllium	0.59	B		P	
7440-43-9	Cadmium	0.87			P	K,W
7440-70-2	Calcium	18600		*E	P	
7440-47-3	Chromium	27.7			P	
7440-48-4	Cobalt	10.1			P	
7440-50-8	Copper	30.3		*	P	J,K
7439-89-6	Iron	29000			P	
7439-92-1	Lead	92.6			P	
7439-95-4	Magnesium	10900		*E	P	
7439-96-5	Manganese	443			P	
7439-97-6	Mercury	0.42			CV	
7440-02-0	Nickel	9.8			P	
7440-09-7	Potassium	1140			P	
7782-49-2	Selenium	4.1		N	P	L,M
7440-22-4	Silver	0.48	B		P	
7440-23-5	Sodium	1230			P	
7440-28-0	Thallium	0.72	U	N	P	UL,W RyM
7440-62-2	Vanadium	35.1		N	P	K,W
7440-66-6	Zinc	725		*E	P	J,K

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

DATA VALIDATION WORKSHEET

Volatile Organic Analysis by GC/MS

Reviewer: RA
Date: 2/6/03
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: U2788
Test Name: 8260B
Method No.: VOC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If the temperature of the cooler was elevated (> 10 ^{O}C) or bubble size in aqueous sample was too big (tiny bubble is OK.), then flag all positive results with a "L" and all non-detects "UL".		✓	
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP? QAPP say - no HCl preservation.	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous unpreserved - 7 days for aromatic compounds All others - 14 days.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

Collected	analyzed
11/19/02	12/1/02
11/20/02	4

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per GCMS, 20 samples, batch, matrix, and level)?	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common volatile lab contaminants - methylene chloride, acetone, and 2-butanone) the amount in the associated blank.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If Yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the DV report.	✓		

Notes: MB 12,2,02 toluene 3 1,3 DCB ·3, 1,4-DCB ,3, 1,2-DCB ·2
1,2,4- TCB 0.8 Pos <5x → B, E
MB 12,2,02 MC13 0.6, toluene 3, 1,4-DCB ·3, 1,2,4-TCB 0.6
<10x B, E, <5x B, E for others
trip & pos toluene equip in SDG R2788 Were prev. for MB, no more

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 15% and %D < ± 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < CL? CL >0.10 for chloromethane, 1,1-dichloroethane, & bromoform or >0.30 for chlorobenzene & 1,1,2,2-tetrachloroethane. If yes, L(+)/R(-).		✓	

Notes: IC 11,28,02 toluene 25.45% RSD Pos Prev. due to MB, no more action
see attached
ND's → UJ/C Pos J/C

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	✓		
5.2	Are BFB enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
5.3	Have all samples been analyzed within twelve hours of the BFB tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for BFB been met for each instrument used?	✓		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery							Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?						✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?						✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?								✓
	If any system monitoring compound(s) in the volatile fraction is out of specification, there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.								
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? DV report should indicate that extraction efficiency/ method accuracy cannot be verified.								✓
		1 or more <10%	1 high/low	2 or 3 high/low	2 or 3 all low	2 or 3 all high			
	Positives	L	J	J	L	K			
	Non-detects	R	UJ	UJ	UL	NONE			
	Note: The B qualifier remains over surrogate flagging.								

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?			
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

Not in this SDG.

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).		✓	
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes: Chlorobenzene-d5 and 1,4-dichlorobenzene < QC in TESTPIT1F and R
1,4-DCB < QC in TESTPIT1F2 and also re-
re-analyses had better recoveries. use re-analyses
TESTPIT1FRE, TESTPIT1F2RE, J, UJ, i unless prev.

10.0 Field Duplicate		Yes	No	NA
10.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes:

405B13C		RL	D-6	RPD
Carbon disulfide	1		1	0%
acetone	48	20	20	OK ✓
Trichloroethene	1		1	0%
Xylene(total)	2		240	OK
methylcyclohexane	0.9		8U	OK ✓

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			✓

Notes: TICs → NJ+

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness =_____			

Notes:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKWC

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21509-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21509-1B59U

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	0.6	J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKWC

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21509-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21509-1B59U

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/01/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	0.3	J
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	0.6	J
1330-20-7	Xylene (total)	15	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVT

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1A59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(ul

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	5	U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLKVT

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix: (soil/water) SOIL Lab Sample ID: WG21489-1

Sample wt/vol: 5.00(g/mL) G Lab File ID: WG21489-1A59

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/02/02

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropyl Benzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	0.3	J
106-46-7	1,4-Dichlorobenzene	0.3	J
95-50-1	1,2-Dichlorobenzene	0.2	J
96-12-8	1,2-Dibromo-3-Chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	0.8	J
1330-20-7	Xylene (total)	15	U
79-20-9	Methyl acetate	5	U
110-82-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Instrument ID: 5972HP59 Calibration Date(s): 11/28/02 11/28/02

Column: ZB624 ID: 0.32 (mm) Calibration Time(s): 1512 1719

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
Dichlorodifluoromethane	AVRG		0.58194483		14.548	15.000
Chloromethane	AVRG		0.38011958		12.264	15.000
Vinyl Chloride	AVRG		0.31132743		12.358	30.000
Bromomethane	AVRG		0.28505167		12.477	15.000
Chloroethane	AVRG		0.13602951		9.518	15.000
Trichlorofluoromethane	AVRG		0.62315875		8.848	15.000
1,1-Dichloroethene	AVRG		0.25167041		9.232	30.000
Carbon disulfide	AVRG		0.98029427		12.463	15.000
1,1,2-trichloro-1,2,2-triflu	2ORDR	-0.0455235	2.54271494	-0.2021518	0.9985746	0.9900000
Acetone	2ORDR	-0.4211162	39.5652122	-31.890444	0.9965309	0.9900000
Methylene Chloride	2ORDR	-0.0509946	4.49184604	-0.6857701	0.9977921	0.9900000
trans-1,2-Dichloroethene	AVRG		0.26576469		10.623	15.000
Methyl-tert-butyl ether	AVRG		0.41471586		10.259	15.000
1,1-Dichloroethane	AVRG		0.47548515		9.448	15.000
cis-1,2-Dichloroethene	AVRG		0.26158161		10.650	15.000
2-butanone	AVRG		0.05158196		9.812	15.000
Chloroform	AVRG		0.54653304		9.271	30.000
1,1,1-Trichloroethane	AVRG		0.48004021		8.709	15.000
Carbon Tetrachloride	AVRG		0.41737627		9.415	15.000
Benzene	AVRG		0.77004565		9.504	15.000
1,2-Dichloroethane	AVRG		0.35465501		8.258	15.000
Trichloroethene	AVRG		0.20561693		12.162	15.000
1,2-Dichloropropane	AVRG		0.21046408		8.851	30.000
Bromodichloromethane	AVRG		0.36300832		10.200	15.000
cis-1,3-Dichloropropene	AVRG		0.32416035		12.282	15.000
4-Methyl-2-pentanone	2ORDR	0.09689007	5.32632996	-0.2818983	0.9980348	0.9900000
Toluene	AVRG		1.00382401		25.468	30.000
trans-1,3-Dichloropropene	AVRG		0.49321268		9.768	15.000
1,1,2-Trichloroethane	AVRG		0.26996210		12.095	15.000
Tetrachloroethene	AVRG		0.32525381		13.234	15.000
2-hexanone	2ORDR	0.17421115	7.79902845	-0.5313186	0.9981738	0.9900000
Dibromochloromethane	AVRG		0.40819062		14.790	15.000
1,2-Dibromoethane	AVRG		0.32261357		13.546	15.000
Chlorobenzene	AVRG		0.87234265		10.776	15.000
Ethylbenzene	AVRG		0.42324742		11.950	30.000
Styrene	AVRG		0.84331753		14.387	15.000
Bromoform	2ORDR	0.03410376	3.86366011	-0.6091995	0.9984632	0.9900000
Isopropyl Benzene	AVRG		1.39888971		13.027	15.000
1,1,2,2-Tetrachloroethane	AVRG		0.68516489		9.330	15.000
1,3-Dichlorobenzene	AVRG		1.32404232		12.253	15.000
1,4-Dichlorobenzene	AVRG		1.36643276		10.360	15.000
1,2-Dichlorobenzene	AVRG		1.15134531		11.984	15.000
1,2-Dibromo-3-Chloropropane	AVRG		0.08106016		12.134	15.000
1,2,4-Trichlorobenzene	AVRG		0.67890148		11.066	15.000

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Instrument ID: 5972HP59 Calibration Date: 12/01/02 Time: 1629

Lab File ID: GT021201B59 Init. Calib. Date(s): 11/28/02 11/28/02

Init. Calib. Times: 1512 1719

GC Column: ZB624 ID: 0.32 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.5820000	0.4187397	0.4187397	0.001	-28.05	90.00	AVRG
Chloromethane	0.3800000	0.3272035	0.3272035	0.1	-13.89	90.00	AVRG
Vinyl Chloride	0.3110000	0.2592818	0.2592818	0.001	-16.63	20.00	AVRG
Bromomethane	0.2850000	0.1713844	0.1713844	0.001	-39.86	90.00	AVRG
Chloroethane	0.1360000	0.1277966	0.1277966	0.001	-6.03	90.00	AVRG
Trichlorofluoromethane	0.6230000	0.5180740	0.5180740	0.001	-16.84	90.00	AVRG
1,1-Dichloroethene	0.2520000	0.2240856	0.2240856	0.001	-11.08	20.00	AVRG
Carbon disulfide	0.9800000	0.8610176	0.8610176	0.001	-12.14	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	223.77585	250.00000	0.3815012	0.001	-10.49	90.00	2RDR
Acetone	639.24393	625.00000	0.0321971	0.001	2.28	90.00	2RDR
Methylene Chloride	246.39098	250.00000	0.2395234	0.001	-1.44	90.00	2RDR
trans-1,2-Dichloroethene	0.2660000	0.2417331	0.2417331	0.001	-9.12	90.00	AVRG
Methyl-tert-butyl ether	0.4140000	0.3539083	0.3539083	0.001	-14.51	90.00	AVRG
1,1-Dichloroethane	0.4760000	0.4226669	0.4226669	0.1	-11.20	90.00	AVRG
cis-1,2-Dichloroethene	0.2620000	0.2407075	0.2407075	0.001	-8.13	90.00	AVRG
2-butanone	0.0520000	0.0486739	0.0486739	0.001	-6.40	90.00	AVRG
Chloroform	0.5460000	0.4715021	0.4715021	0.001	-13.64	20.00	AVRG
1,1,1-Trichloroethane	0.4800000	0.4044961	0.4044961	0.001	-15.73	90.00	AVRG
Carbon Tetrachloride	0.4170000	0.3406490	0.3406490	0.001	-18.31	90.00	AVRG
Benzene	0.7700000	0.7360115	0.7360115	0.001	-4.41	90.00	AVRG
1,2-Dichloroethane	0.3550000	0.2997418	0.2997418	0.001	-15.56	90.00	AVRG
Trichloroethene	0.2060000	0.1857179	0.1857179	0.001	-9.84	90.00	AVRG
1,2-Dichloropropane	0.2100000	0.2067480	0.2067480	0.001	-1.55	20.00	AVRG
Bromodichloromethane	0.3630000	0.3241457	0.3241457	0.001	-10.70	90.00	AVRG
cis-1,3-Dichloropropene	0.3240000	0.3082358	0.3082358	0.001	-4.86	90.00	AVRG
4-Methyl-2-pentanone	574.35681	625.00000	0.1690380	0.001	-8.10	90.00	2RDR
Toluene	1.0040000	0.8309777	0.8309777	0.001	-17.23	20.00	AVRG
trans-1,3-Dichloropropene	0.4930000	0.4620751	0.4620751	0.001	-6.27	90.00	AVRG
1,1,2-Trichloroethane	0.2700000	0.2612930	0.2612930	0.001	-3.22	90.00	AVRG
Tetrachloroethene	0.3250000	0.2953313	0.2953313	0.001	-9.13	90.00	AVRG
2-hexanone	573.05949	625.00000	0.1107181	0.001	-8.31	90.00	2RDR
Dibromochloromethane	0.4080000	0.3775374	0.3775374	0.001	-7.47	90.00	AVRG
1,2-Dibromoethane	0.3220000	0.3014456	0.3014456	0.001	-6.38	90.00	AVRG
Chlorobenzene	0.8720000	0.8308759	0.8308759	0.3	-4.72	90.00	AVRG
Ethylbenzene	0.4230000	0.4184410	0.4184410	0.001	-1.08	20.00	AVRG
Styrene	0.8430000	0.8328998	0.8328998	0.001	-1.20	90.00	AVRG
Bromoform	220.28151	250.00000	0.2273800	0.1	-11.89	90.00	2RDR
Isopropyl Benzene	1.3990000	1.3320364	1.3320364	0.001	-4.79	90.00	AVRG
1,1,2,2-Tetrachloroethane	0.6850000	0.6347329	0.6347329	0.3	-7.34	90.00	AVRG
1,3-Dichlorobenzene	1.3240000	1.2752309	1.2752309	0.001	-3.68	90.00	AVRG
1,4-Dichlorobenzene	1.3660000	1.2890192	1.2890192	0.001	-5.64	90.00	AVRG
1,2-Dichlorobenzene	1.1510000	1.1051350	1.1051350	0.001	-3.98	90.00	AVRG

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Instrument ID: 5972HP59 Calibration Date: 12/02/02 Time: 1217

Lab File ID: GT021202A59 Init. Calib. Date(s): 11/28/02 11/28/02

Init. Calib. Times: 1512 1719

GC Column: ZB624 ID: 0.32 (mm)

COMPOUND	RRF or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Dichlorodifluoromethane	0.5820000	0.4828459	0.4828459	0.001	-17.04	90.00	AVRG
Chloromethane	0.3800000	0.3212536	0.3212536	0.1	-15.46	90.00	AVRG
Vinyl Chloride	0.3110000	0.3060492	0.3060492	0.001	-1.59	20.00	AVRG
Bromomethane	0.2850000	0.2181095	0.2181095	0.001	-23.47	90.00	AVRG
Chloroethane	0.1360000	0.1516142	0.1516142	0.001	11.48	90.00	AVRG
Trichlorofluoromethane	0.6230000	0.5879387	0.5879387	0.001	-5.63	90.00	AVRG
1,1-Dichloroethene	0.2520000	0.2530503	0.2530503	0.001	0.42	20.00	AVRG
Carbon disulfide	0.9800000	0.6706587	0.6706587	0.001	-31.56	90.00	AVRG
1,1,2-trichloro-1,2,2-triflu	231.03880	250.00000	0.3936770	0.001	-7.58	90.00	2RDR
Acetone	585.34110	625.00000	0.0297066	0.001	-6.34	90.00	2RDR
Methylene Chloride	271.17053	250.00000	0.2634249	0.001	8.47	90.00	2RDR
trans-1,2-Dichloroethene	0.2660000	0.2787611	0.2787611	0.001	4.80	90.00	AVRG
Methyl-tert-butyl ether	0.4140000	0.3682903	0.3682903	0.001	-11.04	90.00	AVRG
1,1-Dichloroethane	0.4760000	0.4507939	0.4507939	0.1	-5.30	90.00	AVRG
cis-1,2-Dichloroethene	0.2620000	0.2882515	0.2882515	0.001	10.02	90.00	AVRG
2-butanone	0.0520000	0.0451237	0.0451237	0.001	-13.22	90.00	AVRG
Chloroform	0.5460000	0.5087610	0.5087610	0.001	-6.82	20.00	AVRG
1,1,1-Trichloroethane	0.4800000	0.4508335	0.4508335	0.001	-6.08	90.00	AVRG
Carbon Tetrachloride	0.4170000	0.3951116	0.3951116	0.001	-5.25	90.00	AVRG
Benzene	0.7700000	0.8170357	0.8170357	0.001	6.11	90.00	AVRG
1,2-Dichloroethane	0.3550000	0.2977221	0.2977221	0.001	-16.13	90.00	AVRG
Trichloroethene	0.2060000	0.2300691	0.2300691	0.001	11.68	90.00	AVRG
1,2-Dichloropropane	0.2100000	0.2155403	0.2155403	0.001	2.64	20.00	AVRG
Bromodichloromethane	0.3630000	0.3417414	0.3417414	0.001	-5.86	90.00	AVRG
cis-1,3-Dichloropropene	0.3240000	0.3370390	0.3370390	0.001	4.02	90.00	AVRG
4-Methyl-2-pentanone	506.16897	625.00000	0.1476589	0.001	-19.01	90.00	2RDR
Toluene	1.0040000	0.9437863	0.9437863	0.001	-6.00	20.00	AVRG
trans-1,3-Dichloropropene	0.4930000	0.4587342	0.4587342	0.001	-6.95	90.00	AVRG
1,1,2-Trichloroethane	0.2700000	0.2816586	0.2816586	0.001	4.32	90.00	AVRG
Tetrachloroethene	0.3250000	0.3682922	0.3682922	0.001	13.32	90.00	AVRG
2-hexanone	511.29960	625.00000	0.0975818	0.001	-18.19	90.00	2RDR
Dibromochloromethane	0.4080000	0.3984848	0.3984848	0.001	-2.33	90.00	AVRG
1,2-Dibromoethane	0.3220000	0.3372480	0.3372480	0.001	4.74	90.00	AVRG
Chlorobenzene	0.8720000	0.9471709	0.9471709	0.3	8.62	90.00	AVRG
Ethylbenzene	0.4230000	0.4765210	0.4765210	0.001	12.65	20.00	AVRG
Styrene	0.8430000	0.9041180	0.9041180	0.001	7.25	90.00	AVRG
Bromoform	242.11612	250.00000	0.2518327	0.1	-3.15	90.00	2RDR
Isopropyl Benzene	1.3990000	1.5317454	1.5317454	0.001	9.49	90.00	AVRG
1,1,2,2-Tetrachloroethane	0.6850000	0.6796516	0.6796516	0.3	-0.78	90.00	AVRG
1,3-Dichlorobenzene	1.3240000	1.4467660	1.4467660	0.001	9.27	90.00	AVRG
1,4-Dichlorobenzene	1.3660000	1.4712163	1.4712163	0.001	7.70	90.00	AVRG
1,2-Dichlorobenzene	1.1510000	1.2266370	1.2266370	0.001	6.57	90.00	AVRG

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Instrument ID: 5972HP59 Calibration Date: 12/02/02 Time: 1217

Lab File ID: GT021202A59 Init. Calib. Date(s): 11/28/02 11/28/02

Init. Calib. Times: 1512 1719

GC Column: ZB624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$ or AMOUNT	RRF50 or AMOUNT	CCAL RRF50	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dibromo-3-Chloropropane	0.0810000	0.0965366	0.0965366	0.001	19.18	90.00	AVRG
1,2,4-Trichlorobenzene	0.6790000	0.7209704	0.7209704	0.001	6.18	90.00	AVRG
Xylene (total)	0.5290000	0.5750350	0.5750350	0.001	8.70	90.00	AVRG
Methyl acetate	0.1030000	0.0774981	0.0774981	0.001	-24.76	90.00	AVRG
Cyclohexane	0.3690000	0.3466953	0.3466953	0.001	-6.04	90.00	AVRG
Methylcyclohexane	0.3000000	0.3545512	0.3545512	0.001	18.18	90.00	AVRG
Dibromofluoromethane	0.3360000	0.3844832	0.3844832	0.001	14.43	90.00	AVRG
1,2-Dichloroethane-d4	0.2960000	0.2649122	0.2649122	0.001	-10.50	90.00	AVRG
Toluene-d8	1.1690000	1.4311604	1.4311604	0.001	22.43	90.00	AVRG
Bromofluorobenzene	1.0230000	1.1430986	1.1430986	0.001	11.74	90.00	AVRG

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Lab File ID (Standard): GT021201B59 Date Analyzed: 12/01/02

Instrument ID: 5972HP59 Time Analyzed: 1629

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	800569	8.99	471352	12.47	242669	14.47
	UPPER LIMIT	1601138	9.49	942704	12.97	485338	14.97
	LOWER LIMIT	400284	8.49	235676	11.97	121334	13.97
	CLIENT SAMPLE NO.						
01	VBLKWC	697673	8.99	397638	12.47	200444	14.47
02	VWCLCS	673329	8.99	396449	12.47	201176	14.47
03	40SB13A	995062	8.98	583388	12.47	263144	14.47
04	40SB13B	1034523	8.98	598502	12.47	252312	14.46
05	40SB13C	885128	8.99	565922	12.47	293560	14.47
06	D-6	963203	8.99	591695	12.47	303998	14.47
07	TESTPIT1F	417523	8.98	169631*	12.46	52075*	14.46
08	TESTPIT1F2	562931	8.99	269323	12.47	96644*	14.47
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Lab File ID (Standard): GT021202A59 Date Analyzed: 12/02/02

Instrument ID: 5972HP59 Time Analyzed: 1217

GC Column: ZB624 ID: 0.32 (mm) Heated Purge: (Y/N) Y

		IS1(FBZ) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	910396	8.99	559010	12.48	277501	14.47
	UPPER LIMIT	1820792	9.49	1118020	12.98	555002	14.97
	LOWER LIMIT	455198	8.49	279505	11.98	138750	13.97
	CLIENT SAMPLE NO.						
01	VBLKVT	882095	8.99	522902	12.47	254462	14.47
02	VTLCS	891780	8.99	528224	12.47	263385	14.47
03	TESTPIT1FRE	531014	8.99	237998*	12.48	94515*	14.47
04	TESTPIT1F2RE	636162	8.99	313547	12.48	110536*	14.47
05							
06							
07							
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10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (FBZ) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1096

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-15

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-15B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,E
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1094

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-17

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-17B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	UUJ,C
74-87-3	Chloromethane	5	UUJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,U
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK1022

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2776-13

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-13B52

Level: (low/med) LOW Date Received: 11/19/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,E
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	3	J
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane		

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-14

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-14B52

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ/C
74-87-3	Chloromethane	5	U UJ/C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	2	JB UC
76-13-1	1,1,2-trichloro-1,2,2-triflu	13	U
67-64-1	Acetone	5	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	4	J
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane		

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix: (soil/water) WATER Lab Sample ID: R2788-16

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2788-16B52

Level: (low/med) LOW Date Received: 11/21/02

% Moisture: not dec. _____ Date Analyzed: 11/28/02

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U UJ,C
74-87-3	Chloromethane	5	U UJ,C
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-15-0	Carbon disulfide	5	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	1	JB B,Z
67-64-1	Acetone	13	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl-tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	13	U
108-88-3	Toluene	3	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-hexanone	13	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 2/4/03
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: U2788
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

Collected	extracted	analyzed
11/20,02) 11/19/02	11/22/02	11/30,02
11/20/02	"	12/3/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes:

EBs in R2798 are ND

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes: see attached atrazine UJ,r in all Pos J,r for others unless prev.

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓
	1 or more <10% / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high Positives: L / J / L / K Non-detects: R / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?			
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).		✓	
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes: TESTPIT1F2 Perylene-d12 <QC use DF=2 results ✓ for the affected compds only.

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 405B13C D-6
n-nitrosodiphenyl amine 400U 78 OK ✓

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			✓

Notes: TIC → NJ / L

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 7			
12.1.2	Number of target compounds in each analysis: 65			
12.1.3	Number of results rejected and not reported: 5			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 98%			

Notes:

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Instrument ID: 5972HP64 Calibration Date(s): 11/25/02 11/25/02

Column: RTX-5MS ID: 0.32 (mm) Calibration Time(s): 2041 2337

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Benzaldehyde	AVRG	1.13360798	18.776	50.000
Phenol	AVRG	1.61419381	10.437	30.000
Bis(2-chloroethyl)ether	AVRG	1.42279476	5.394	50.000
2-Chlorophenol	AVRG	1.32017786	5.673	50.000
2-Methylphenol	AVRG	1.35086999	10.127	50.000
2,2'-oxybis(1-Chloropropane)	AVRG	1.80136619	12.147	50.000
Acetophenone	AVRG	2.11766249	6.745	50.000
4-Methylphenol	AVRG	1.25831343	7.448	50.000
N-Nitroso-di-N-propylamine	AVRG	0.98072155	14.875	50.000
Hexachloroethane	AVRG	0.69301907	8.122	50.000
Nitrobenzene	AVRG	0.46992312	7.948	50.000
Isophorone	AVRG	0.80071477	4.460	50.000
2-Nitrophenol	AVRG	0.23220109	11.639	30.000
2,4-Dimethylphenol	AVRG	0.30596015	17.405	50.000
Bis(2-chloroethoxy)methane	AVRG	0.48218882	3.944	50.000
2,4-Dichlorophenol	AVRG	0.33477862	7.280	30.000
Naphthalene	AVRG	1.07954606	6.261	50.000
4-Chloroaniline	AVRG	0.49471199	5.176	50.000
Hexachlorobutadiene	AVRG	0.28158775	10.441	30.000
Caprolactam	AVRG	0.13579129	5.560	50.000
4-Chloro-3-methylphenol	AVRG	0.35560183	7.474	30.000
2-Methylnaphthalene	AVRG	0.79120021	11.071	50.000
Hexachlorocyclopentadiene	AVRG	0.44372014	17.611	50.000
2,4,6-Trichlorophenol	AVRG	0.44394950	10.060	30.000
2,4,5-Trichlorophenol	AVRG	0.50353440	12.902	50.000
1,1'-Biphenyl	AVRG	1.35796936	13.136	50.000
2-Chloronaphthalene	AVRG	0.99563885	11.264	50.000
2-Nitroaniline	AVRG	0.47461553	11.023	50.000
Dimethylphthalate	AVRG	1.40972693	14.700	50.000
2,6-Dinitrotoluene	AVRG	0.33539014	8.229	50.000
Acenaphthylene	AVRG	1.73675078	12.676	50.000
3-Nitroaniline	AVRG	0.34294245	8.665	50.000
Acenaphthene	AVRG	1.03570200	13.301	30.000
2,4-Dinitrophenol	AVRG	0.21159915	12.847	50.000
4-Nitrophenol	AVRG	0.31841348	14.689	50.000
2,4-Dinitrotoluene	AVRG	0.45746846	9.658	50.000
Dibenzofuran	AVRG	1.72116431	14.031	50.000
Diethylphthalate	AVRG	1.43888496	8.264	50.000
4-Chlorophenyl-phenylether	AVRG	0.68523536	18.722	50.000
Fluorene	AVRG	1.28222397	12.940	50.000
4-Nitroaniline	AVRG	0.35790926	13.788	50.000
4,6-Dinitro-2-methylphenol	AVRG	0.18420774	12.173	50.000
N-Nitrosodiphenylamine	AVRG	0.53755439	15.842	30.000
4-Bromophenyl-phenylether	AVRG	0.28145110	6.424	50.000

FORM 6
SEMIVOLATILE INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Instrument ID: 5972HP64 Calibration Date(s): 11/25/02 11/25/02

Column: RTX-5MS ID: 0.32 (mm) Calibration Time(s): 2041 2337

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2	MAX %RSD OR R^2
Hexachlorobenzene	AVRG	0.33354824	5.544	50.000
Atrazine	AVRG	0.13583776	69.746	50.000
Pentachlorophenol	AVRG	0.19474831	8.878	30.000
Phenanthrene	AVRG	1.17623288	7.801	50.000
Anthracene	AVRG	1.16871125	7.327	50.000
Carbazole	AVRG	1.04779295	9.078	50.000
Di-n-butylphthalate	AVRG	1.47285411	7.421	50.000
Fluoranthene	AVRG	1.34664335	6.073	30.000
Pyrene	AVRG	1.38506027	5.285	50.000
Butylbenzylphthalate	AVRG	0.68635712	5.722	50.000
3,3'-Dichlorobenzidine	AVRG	0.44742820	6.631	50.000
bis(2-ethylhexyl)Phthalate	AVRG	0.88166660	4.730	50.000
Benzo(a)anthracene	AVRG	1.29223432	4.680	50.000
Chrysene	AVRG	1.12418713	6.775	50.000
Di-n-octylphthalate	AVRG	2.12802595	3.080	30.000
Benzo(b)fluoranthene	AVRG	1.79263450	12.079	50.000
Benzo(k)fluoranthene	AVRG	1.73055574	14.984	50.000
Benzo(a)pyrene	AVRG	1.53613181	5.206	30.000
Indeno(1,2,3-cd)pyrene	AVRG	1.48389065	5.533	50.000
Dibenzo(a,h)anthracene	AVRG	1.40714919	4.582	50.000
Benzo(g,h,i)perylene	AVRG	1.42625822	6.157	50.000
2-Fluorophenol	AVRG	1.58282738	3.090	50.000
Phenol-d5	AVRG	1.81419241	7.581	50.000
Nitrobenzene-d5	AVRG	0.54448082	4.139	50.000
2-Fluorobiphenyl	AVRG	1.37030959	10.437	50.000
2,4,6-Tribromophenol	AVRG	0.37860091	8.911	50.000
Terphenyl-d14	AVRG	1.04946645	3.715	50.000

Average %RSD test result.

Calculate Average %RSD: 9.967387199
Maximum Average %RSD: 15.00000000

Note: Passes Average %RSD Test.

FORM VI SV

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Instrument ID: 5972HP64 Calibration Date: 11/29/02 Time: 2129

Lab File ID: HG021129B64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
N-Nitrosodiphenylamine	0.5380000	0.5362532	0.01	-0.32	20.00	AVRG	
4-Bromophenyl-phenylether	0.2810000	0.2896092	0.01	3.06	50.00	AVRG	
Hexachlorobenzene	0.3340000	0.3456056	0.01	3.47	50.00	AVRG	
Atrazine	0.1360000	0.0567297	0.01	-58.29	50.00	AVRG	<- Proi flagged
Pentachlorophenol	0.1940000	0.1904098	0.05	-1.85	20.00	AVRG	
Phenanthrene	1.1760000	1.1338179	0.01	-3.59	50.00	AVRG	
Anthracene	1.1690000	1.1626193	0.01	-0.54	50.00	AVRG	
Carbazole	1.0480000	1.0431003	0.01	-0.47	50.00	AVRG	
Di-n-butylphthalate	1.4730000	1.4236902	0.01	-3.35	50.00	AVRG	
Fluoranthene	1.3470000	1.3451662	0.01	-0.14	20.00	AVRG	
Pyrene	1.3850000	1.4222197	0.01	2.69	50.00	AVRG	
Butylbenzylphthalate	0.6860000	0.6898831	0.01	0.57	50.00	AVRG	
3,3'-Dichlorobenzidine	0.4470000	0.4518917	0.01	1.09	50.00	AVRG	
bis(2-ethylhexyl)Phthalate	0.8820000	0.8350465	0.01	-5.32	50.00	AVRG	
Benzo(a)anthracene	1.2920000	1.3028655	0.01	0.84	50.00	AVRG	
Chrysene	1.1240000	1.1715618	0.01	4.23	50.00	AVRG	
Di-n-octylphthalate	2.1280000	2.0355187	0.01	-4.34	20.00	AVRG	
Benzo(b)fluoranthene	1.7930000	1.8868480	0.01	5.23	50.00	AVRG	
Benzo(k)fluoranthene	1.7300000	1.7892125	0.01	3.42	50.00	AVRG	
Benzo(a)pyrene	1.5360000	1.5843385	0.01	3.15	20.00	AVRG	
Indeno(1,2,3-cd)pyrene	1.4840000	1.5100204	0.01	1.75	50.00	AVRG	
Dibenzo(a,h)anthracene	1.4070000	1.3459153	0.01	-4.34	50.00	AVRG	
Benzo(g,h,i)perylene	1.4260000	1.3317599	0.01	-6.61	50.00	AVRG	
2-Fluorophenol	1.5830000	1.5839030	0.01	0.06	50.00	AVRG	
Phenol-d5	1.8140000	1.7633580	0.01	-2.79	50.00	AVRG	
Nitrobenzene-d5	0.5440000	0.5150717	0.01	-5.32	50.00	AVRG	
2-Fluorobiphenyl	1.3700000	1.5090908	0.01	10.15	50.00	AVRG	
2,4,6-Tribromophenol	0.3780000	0.3735916	0.01	-1.17	50.00	AVRG	
Terphenyl-d14	1.0500000	1.0932764	0.01	4.12	50.00	AVRG	

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Instrument ID: 5972HP64 Calibration Date: 12/03/02 Time: 0818

Lab File ID: HG021203A64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Benzaldehyde	1.1340000	1.1063824	0.01	-2.44	50.00	AVRG
Phenol	1.6140000	1.7230624	0.01	6.76	20.00	AVRG
Bis(2-chloroethyl)ether	1.4220000	1.4765532	0.01	3.84	50.00	AVRG
2-Chlorophenol	1.3200000	1.1947832	0.01	-9.49	50.00	AVRG
2-Methylphenol	1.3510000	1.2216191	0.01	-9.58	50.00	AVRG
2,2'-oxybis(1-Chloropropane)	1.8010000	2.2658332	0.01	25.81	50.00	AVRG
Acetophenone	2.1180000	1.9326894	0.01	-8.75	50.00	AVRG
4-Methylphenol	1.2580000	1.0839223	0.01	-13.84	50.00	AVRG
N-Nitroso-di-N-propylamine	0.9810000	0.9131617	0.05	-6.92	50.00	AVRG
Hexachloroethane	0.6930000	0.5734488	0.01	-17.25	50.00	AVRG
Nitrobenzene	0.4700000	0.5167737	0.01	9.95	50.00	AVRG
Isophorone	0.8010000	0.9357324	0.01	16.82	50.00	AVRG
2-Nitrophenol	0.2320000	0.2485925	0.01	7.15	20.00	AVRG
2,4-Dimethylphenol	0.3060000	0.3253109	0.01	6.31	50.00	AVRG
Bis(2-chloroethoxy)methane	0.4820000	0.5116661	0.01	6.15	50.00	AVRG
2,4-Dichlorophenol	0.3350000	0.3351405	0.01	0.04	20.00	AVRG
Naphthalene	1.0790000	1.0847187	0.01	0.53	50.00	AVRG
4-Chloroaniline	0.4940000	0.4652517	0.01	-5.82	50.00	AVRG
Hexachlorobutadiene	0.2810000	0.2547416	0.01	-9.34	20.00	AVRG
Caprolactam	0.1360000	0.1389416	0.01	2.16	50.00	AVRG
4-Chloro-3-methylphenol	0.3560000	0.3514961	0.01	-1.26	20.00	AVRG
2-Methylnaphthalene	0.7910000	0.7556158	0.01	-4.47	50.00	AVRG
Hexachlorocyclopentadiene	0.4440000	0.3455048	0.05	-22.18	50.00	AVRG
2,4,6-Trichlorophenol	0.4440000	0.3608926	0.01	-18.72	20.00	AVRG
2,4,5-Trichlorophenol	0.5040000	0.4744275	0.01	-5.87	50.00	AVRG
1,1'-Biphenyl	1.3580000	1.3194922	0.01	-2.84	50.00	AVRG
2-Chloronaphthalene	0.9960000	0.8633902	0.01	-13.31	50.00	AVRG
2-Nitroaniline	0.4740000	0.5296744	0.01	11.74	50.00	AVRG
Dimethylphthalate	1.4100000	1.3418837	0.01	-4.83	50.00	AVRG
2,6-Dinitrotoluene	0.3350000	0.3152588	0.01	-5.89	50.00	AVRG
Acenaphthylene	1.7360000	1.6648522	0.01	-4.10	50.00	AVRG
3-Nitroaniline	0.3430000	0.3000793	0.01	-12.51	50.00	AVRG
Acenaphthene	1.0360000	0.9185924	0.01	-11.33	20.00	AVRG
2,4-Dinitrophenol	0.2120000	0.1632774	0.05	-22.98	50.00	AVRG
4-Nitrophenol	0.3180000	0.2291896	0.05	-27.93	50.00	AVRG
2,4-Dinitrotoluene	0.4570000	0.4093626	0.01	-10.42	50.00	AVRG
Dibenzofuran	1.7210000	1.6949623	0.01	-1.51	50.00	AVRG
Diethylphthalate	1.4390000	1.2402150	0.01	-13.81	50.00	AVRG
4-Chlorophenyl-phenylether	0.6850000	0.5283143	0.01	-22.87	50.00	AVRG
Fluorene	1.2820000	1.1985725	0.01	-6.51	50.00	AVRG
4-Nitroaniline	0.3580000	0.3334613	0.01	-6.85	50.00	AVRG
4,6-Dinitro-2-methylphenol	0.1840000	0.1920705	0.01	4.39	50.00	AVRG

FORM 7B
SEMIVOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Instrument ID: 5972HP64 Calibration Date: 12/03/02 Time: 0818

Lab File ID: HG021203A64 Init. Calib. Date(s): 11/25/02 11/25/02

Init. Calib. Times: 2041 2337

GC Column: RTX-5MS ID: 0.32 (mm)

COMPOUND	RRF OR AMOUNT	RRF80.000 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
N-Nitrosodiphenylamine	0.5380000	0.5833781	0.01	8.43	20.00	AVRG
4-Bromophenyl-phenylether	0.2810000	0.2533624	0.01	-9.84	50.00	AVRG
Hexachlorobenzene	0.3340000	0.3004832	0.01	-10.03	50.00	AVRG
Atrazine ✓	0.1360000	0.0750325	0.01	-44.83	50.00	AVRG
Pentachlorophenol	0.1940000	0.1712977	0.05	-11.70	20.00	AVRG
Phenanthrene	1.1760000	1.1967142	0.01	1.76	50.00	AVRG
Anthracene	1.1690000	1.0868345	0.01	-7.03	50.00	AVRG
Carbazole	1.0480000	1.1115563	0.01	6.06	50.00	AVRG
Di-n-butylphthalate	1.4730000	1.4967253	0.01	1.61	50.00	AVRG
Fluoranthene	1.3470000	1.2911122	0.01	-4.15	20.00	AVRG
Pyrene	1.3850000	1.5291007	0.01	10.40	50.00	AVRG
Butylbenzylphthalate	0.6860000	0.8147271	0.01	18.76	50.00	AVRG
3,3'-Dichlorobenzidine	0.4470000	0.4098217	0.01	-8.32	50.00	AVRG
bis(2-ethylhexyl)Phthalate	0.8820000	0.9545497	0.01	8.22	50.00	AVRG
Benzo(a)anthracene	1.2920000	1.3357046	0.01	3.38	50.00	AVRG
Chrysene	1.1240000	1.0780790	0.01	-4.08	50.00	AVRG
Di-n-octylphthalate	2.1280000	2.4404141	0.01	14.68	20.00	AVRG
Benzo(b)fluoranthene	1.7930000	1.4856376	0.01	-17.14	50.00	AVRG
Benzo(k)fluoranthene	1.7300000	1.8600465	0.01	7.52	50.00	AVRG
Benzo(a)pyrene	1.5360000	1.4050606	0.01	-8.52	20.00	AVRG
Indeno(1,2,3-cd)pyrene	1.4840000	1.2195281	0.01	-17.82	50.00	AVRG
Dibenzo(a,h)anthracene ✓	1.4070000	0.9287468	0.01	-33.99	50.00	AVRG
Benzo(g,h,i)perylene ✓	1.4260000	0.9305294	0.01	-34.74	50.00	AVRG
2-Fluorophenol	1.5830000	1.5080454	0.01	-4.73	50.00	AVRG
Phenol-d5	1.8140000	1.7610008	0.01	-2.92	50.00	AVRG
Nitrobenzene-d5	0.5440000	0.5862255	0.01	7.76	50.00	AVRG
2-Fluorobiphenyl	1.3700000	1.2845620	0.01	-6.24	50.00	AVRG
2,4,6-Tribromophenol	0.3780000	0.3180302	0.01	-15.86	50.00	AVRG
Terphenyl-d14	1.0500000	1.1233450	0.01	6.98	50.00	AVRG

J, UJC

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Lab File ID (Standard): HG021129B64 Date Analyzed: 11/29/02

Instrument ID: 5972HP64 Time Analyzed: 2129

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	1309746	11.58	1243278	17.69	908844	20.22
	UPPER LIMIT	2619492	12.08	2486556	18.19	1817688	20.72
	LOWER LIMIT	654873	11.08	621639	17.19	454422	19.72
	CLIENT SAMPLE NO.						
01	40SB13A	1069712	11.57	885693	17.67	555942	20.21
02	40SB13B	1210437	11.58	1001689	17.67	638886	20.21
03	40SB13C	1123335	11.56	1068447	17.67	730019	20.21
04	D-6	1273515	11.57	1215359	17.67	832160	20.21
05	TESTPIT1F2	875285	11.58	696359	17.71	434297*	20.26
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 2/10/03
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: U2788
Test Name: PEST / PCB
Method No.: 8081A / 8082

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

collected	extracted	analyzed
11/19/02	11/20/02	11/22/02
11/20/02	11/25/02	12/17/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		

Notes: see attached

4,4-DDT 59.92%. 4,4-DDT 70.71

~~RPE in 4050B/A~~ no flag

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?			
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?			
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.			
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?			
5.4	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			
5.5	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).			
5.6	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).			
5.7	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).			
5.8	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).			

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
6.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?		✓	
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)	✓		

	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
	1 out	high/low	No action	No action
	2 out	2 high same column	K	No action
		2 low same column	L, UL	No action
		mixed same column	J, UJ	No action
		2 high diff columns	J	Not applicable
		2 low diff columns	J, UJ	Not applicable
		mixed diff columns	Professional judgement	Not applicable
	3 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		2 high, 1 low	K (2 high)	J (1 low 2nd column)
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
		other mixed	J, UJ	Not applicable
	4 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		Mixed	J, UJ	Not applicable
	If any recovery is >0% and <10% then L(+)/R(-).			
	If any recovery is 0% then R(+/-).			

Notes: TESTPIT1F TCX diluted DF=20 OKV

TESTPIT1F2 DCB (40/33), TCX (40) <QC LULs unless prev. flagged

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?			
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: 4,4-DDT 130, 140 >QC all ND, no Flag

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).	✓		
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes:

11.0 Pesticide Cleanup Checks (Required when any positive result is reported > 38 ug/Kg for soils)		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 3			
12.1.2	Number of target compounds in each analysis: 28			
12.1.3	Number of results rejected and not reported: 0			
12.1.4	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100			

Notes:

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN70 Calibration Date: 11/21/02 Time: 2128

Lab File ID: 077PAR1660QX Init. Calib. Date(s): 11/18/02 11/18/02

Init. Calib. Times: 1528 2234

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1815545.0	1703525.0	0.01	-6.17	15.00	AVRG	
alpha-BHC	1906462.5	1784000.0	0.01	-6.42	15.00	AVRG	
beta-BHC	498746.25	446237.50	0.01	-10.53	15.00	AVRG	
delta-BHC	1707982.5	1632725.0	0.01	-4.41	15.00	AVRG	
gamma-BHC (Lindane)	1799997.5	1706100.0	0.01	-5.22	15.00	AVRG	
4,4'-DDD	845857.50	897806.25	0.01	6.14	15.00	AVRG	
4,4'-DDE	1270732.5	1126387.5	0.01	-11.36	15.00	AVRG	
4,4'-DDT ✓	610179.17	975800.00	0.01	59.92	15.00	AVRG	<- RIC
Dieldrin	1440223.7	1468925.0	0.01	1.99	15.00	AVRG	
Endosulfan I	1346278.7	1382275.0	0.01	2.67	15.00	AVRG	
Endosulfan II	1112272.5	1147525.0	0.01	3.17	15.00	AVRG	
Endosulfan sulfate	945950.62	884531.25	0.01	-6.49	15.00	AVRG	
Endrin	1368336.9	1275956.2	0.01	-6.75	15.00	AVRG	
Endrin Aldehyde	861539.37	807212.50	0.01	-6.30	15.00	AVRG	
Heptachlor	1886787.7	1834500.0	0.01	-2.77	15.00	AVRG	
Heptachlor Epoxide	1611297.5	1488350.0	0.01	-7.63	15.00	AVRG	
Methoxychlor	428964.25	473015.00	0.01	10.27	15.00	AVRG	
Toxaphene	47823.000		0.01	-100.00	15.00	AVRG	<-
(2)	78871.750		0.01	-100.00	15.00	AVRG	<-
(3)	93095.250		0.01	-100.00	15.00	AVRG	<-
(4)	68357.750		0.01	-100.00	15.00	AVRG	<-
(5)	22105.250		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	9182.3330	8195.0000	0.01	-10.75	15.00	AVRG	
(2)	11126.600	9934.0000	0.01	-10.72	15.00	AVRG	
(3)	27400.767	24685.667	0.01	-9.91	15.00	AVRG	
(4)	13085.600	12193.333	0.01	-6.82	15.00	AVRG	
(5)	7801.6000	6896.0000	0.01	-11.61	15.00	AVRG	
Aroclor-1221	2457.7500		0.01	-100.00	15.00	AVRG	<-
(2)	3863.2500		0.01	-100.00	15.00	AVRG	<-
(3)	2556.2500		0.01	-100.00	15.00	AVRG	<-
(4)	10702.000		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	9191.3330		0.01	-100.00	15.00	AVRG	<-
(2)	4081.0000		0.01	-100.00	15.00	AVRG	<-
(3)	9926.3330		0.01	-100.00	15.00	AVRG	<-
(4)	2778.0000		0.01	-100.00	15.00	AVRG	<-
(5)	2653.6670		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	7944.5000		0.01	-100.00	15.00	AVRG	<-
(2)	8640.5000		0.01	-100.00	15.00	AVRG	<-
(3)	21391.500		0.01	-100.00	15.00	AVRG	<-
(4)	10349.500		0.01	-100.00	15.00	AVRG	<-
(5)	5849.0000		0.01	-100.00	15.00	AVRG	<-

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN70 Calibration Date: 11/21/02 Time: 2148

Lab File ID: 078PINDAMQX Init. Calib. Date(s): 11/18/02 11/18/02

Init. Calib. Times: 1528 2234

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1815545.0	1703525.0	0.01	-6.17	15.00	AVRG	
alpha-BHC	1906462.5	1784000.0	0.01	-6.42	15.00	AVRG	
beta-BHC	498746.25	446237.50	0.01	-10.53	15.00	AVRG	
delta-BHC	1707982.5	1632725.0	0.01	-4.41	15.00	AVRG	
gamma-BHC (Lindane)	1799997.5	1706100.0	0.01	-5.22	15.00	AVRG	
4,4'-DDD	845857.50	897806.25	0.01	6.14	15.00	AVRG	
4,4'-DDE	1270732.5	1126387.5	0.01	-11.36	15.00	AVRG	
4,4'-DDT	610179.17	975800.00	0.01	59.92	15.00	AVRG	<-
Dieldrin	1440223.7	1468925.0	0.01	1.99	15.00	AVRG	
Endosulfan I	1346278.7	1382275.0	0.01	2.67	15.00	AVRG	
Endosulfan II	1112272.5	1147525.0	0.01	3.17	15.00	AVRG	
Endosulfan sulfate	945950.62	884531.25	0.01	-6.49	15.00	AVRG	
Endrin	1368336.9	1275956.2	0.01	-6.75	15.00	AVRG	
Endrin Aldehyde	861539.37	807212.50	0.01	-6.30	15.00	AVRG	
Heptachlor	1886787.7	1834500.0	0.01	-2.77	15.00	AVRG	
Heptachlor Epoxide	1611297.5	1488350.0	0.01	-7.63	15.00	AVRG	
Methoxychlor	428964.25	473015.00	0.01	10.27	15.00	AVRG	
Toxaphene	47823.000		0.01	-100.00	15.00	AVRG	<-
(2)	78871.750		0.01	-100.00	15.00	AVRG	<-
(3)	93095.250		0.01	-100.00	15.00	AVRG	<-
(4)	68357.750		0.01	-100.00	15.00	AVRG	<-
(5)	22105.250		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	9182.3330	8195.0000	0.01	-10.75	15.00	AVRG	
(2)	11126.600	9934.0000	0.01	-10.72	15.00	AVRG	
(3)	27400.767	24685.667	0.01	-9.91	15.00	AVRG	
(4)	13085.600	12193.333	0.01	-6.82	15.00	AVRG	
(5)	7801.6000	6896.0000	0.01	-11.61	15.00	AVRG	
Aroclor-1221	2457.7500		0.01	-100.00	15.00	AVRG	<-
(2)	3863.2500		0.01	-100.00	15.00	AVRG	<-
(3)	2556.2500		0.01	-100.00	15.00	AVRG	<-
(4)	10702.000		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	9191.3330		0.01	-100.00	15.00	AVRG	<-
(2)	4081.0000		0.01	-100.00	15.00	AVRG	<-
(3)	9926.3330		0.01	-100.00	15.00	AVRG	<-
(4)	2778.0000		0.01	-100.00	15.00	AVRG	<-
(5)	2653.6670		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	7944.5000		0.01	-100.00	15.00	AVRG	<-
(2)	8640.5000		0.01	-100.00	15.00	AVRG	<-
(3)	21391.500		0.01	-100.00	15.00	AVRG	<-
(4)	10349.500		0.01	-100.00	15.00	AVRG	<-
(5)	5849.0000		0.01	-100.00	15.00	AVRG	<-

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN70 Calibration Date: 11/21/02 Time: 2208

Lab File ID: 079PINDBMQX Init. Calib. Date(s): 11/18/02 11/18/02

Init. Calib. Times: 1528 2234

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1815545.0	1703525.0	0.01	-6.17	15.00	AVRG	
alpha-BHC	1906462.5	1784000.0	0.01	-6.42	15.00	AVRG	
beta-BHC	498746.25	446237.50	0.01	-10.53	15.00	AVRG	
delta-BHC	1707982.5	1632725.0	0.01	-4.41	15.00	AVRG	
gamma-BHC (Lindane)	1799997.5	1706100.0	0.01	-5.22	15.00	AVRG	
4,4'-DDD	845857.50	897806.25	0.01	6.14	15.00	AVRG	
4,4'-DDE	1270732.5	1126387.5	0.01	-11.36	15.00	AVRG	
4,4'-DDT	610179.17	975800.00	0.01	59.92	15.00	AVRG	<-
Dieldrin	1440223.7	1468925.0	0.01	1.99	15.00	AVRG	
Endosulfan I	1346278.7	1382275.0	0.01	2.67	15.00	AVRG	
Endosulfan II	1112272.5	1147525.0	0.01	3.17	15.00	AVRG	
Endosulfan sulfate	945950.62	884531.25	0.01	-6.49	15.00	AVRG	
Endrin	1368336.9	1275956.2	0.01	-6.75	15.00	AVRG	
Endrin Aldehyde	861539.37	807212.50	0.01	-6.30	15.00	AVRG	
Heptachlor	1886787.7	1834500.0	0.01	-2.77	15.00	AVRG	
Heptachlor Epoxide	1611297.5	1488350.0	0.01	-7.63	15.00	AVRG	
Methoxychlor	428964.25	473015.00	0.01	10.27	15.00	AVRG	
Toxaphene	47823.000		0.01	-100.00	15.00	AVRG	<-
(2)	78871.750		0.01	-100.00	15.00	AVRG	<-
(3)	93095.250		0.01	-100.00	15.00	AVRG	<-
(4)	68357.750		0.01	-100.00	15.00	AVRG	<-
(5)	22105.250		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	9182.3330	8195.0000	0.01	-10.75	15.00	AVRG	
(2)	11126.600	9934.0000	0.01	-10.72	15.00	AVRG	
(3)	27400.767	24685.667	0.01	-9.91	15.00	AVRG	
(4)	13085.600	12193.333	0.01	-6.82	15.00	AVRG	
(5)	7801.6000	6896.0000	0.01	-11.61	15.00	AVRG	
Aroclor-1221	2457.7500		0.01	-100.00	15.00	AVRG	<-
(2)	3863.2500		0.01	-100.00	15.00	AVRG	<-
(3)	2556.2500		0.01	-100.00	15.00	AVRG	<-
(4)	10702.000		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	9191.3330		0.01	-100.00	15.00	AVRG	<-
(2)	4081.0000		0.01	-100.00	15.00	AVRG	<-
(3)	9926.3330		0.01	-100.00	15.00	AVRG	<-
(4)	2778.0000		0.01	-100.00	15.00	AVRG	<-
(5)	2653.6670		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	7944.5000		0.01	-100.00	15.00	AVRG	<-
(2)	8640.5000		0.01	-100.00	15.00	AVRG	<-
(3)	21391.500		0.01	-100.00	15.00	AVRG	<-
(4)	10349.500		0.01	-100.00	15.00	AVRG	<-
(5)	5849.0000		0.01	-100.00	15.00	AVRG	<-

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN72 Calibration Date: 11/21/02 Time: 2128

Lab File ID: 077PAR1660QX Init. Calib. Date(s): 11/18/02 11/18/02

Init. Calib. Times: 1528 2234

GC Column: CLPEST2 ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	5106350.0	5201025.0	0.01	1.85	15.00	AVRG	
alpha-BHC	5880600.0	5926775.0	0.01	0.78	15.00	AVRG	
beta-BHC	1573901.3	1576175.0	0.01	0.14	15.00	AVRG	
delta-BHC	5126672.5	4980800.0	0.01	-2.84	15.00	AVRG	
gamma-BHC (Lindane)	5403860.0	5575400.0	0.01	3.17	15.00	AVRG	
4,4'-DDD	2414310.0	2470031.2	0.01	2.31	15.00	AVRG	
4,4'-DDE	3512752.5	3604937.5	0.01	2.62	15.00	AVRG	
4,4'-DDT ✓	1511582.5	2580454.2	0.01	70.71	15.00	AVRG	<-
Dieldrin	3923523.7	4266550.0	0.01	8.74	15.00	AVRG	
Endosulfan I	3586007.5	4000337.5	0.01	11.55	15.00	AVRG	
Endosulfan II	2895252.5	3189637.5	0.01	10.17	15.00	AVRG	
Endosulfan sulfate	2344168.8	2330631.2	0.01	-0.58	15.00	AVRG	
Endrin	3581400.6	3511143.8	0.01	-1.96	15.00	AVRG	
Endrin Aldehyde	2106500.0	2112000.0	0.01	0.26	15.00	AVRG	
Heptachlor	5313690.9	5501600.0	0.01	3.54	15.00	AVRG	
Heptachlor Epoxide	4390267.5	4409000.0	0.01	0.43	15.00	AVRG	
Methoxychlor ✓	978881.25	1137525.0	0.01	16.21	15.00	AVRG	<-
Toxaphene	125901.50		0.01	-100.00	15.00	AVRG	<-
(2)	171446.00		0.01	-100.00	15.00	AVRG	<-
(3)	266125.00		0.01	-100.00	15.00	AVRG	<-
(4)	170604.75		0.01	-100.00	15.00	AVRG	<-
(5)	218133.00		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	26129.367	26337.333	0.01	0.80	15.00	AVRG	
(2)	38466.900	38915.333	0.01	1.16	15.00	AVRG	
(3)	105052.03	105370.00	0.01	0.30	15.00	AVRG	
(4)	48078.700	48183.000	0.01	0.22	15.00	AVRG	
(5)	26490.867	12536.333	0.01	-52.68	15.00	AVRG	<-
Aroclor-1221	5149.5000		0.01	-100.00	15.00	AVRG	<-
(2)	13189.500		0.01	-100.00	15.00	AVRG	<-
(3)	8384.7500		0.01	-100.00	15.00	AVRG	<-
(4)	35150.250		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	29860.333		0.01	-100.00	15.00	AVRG	<-
(2)	15682.333		0.01	-100.00	15.00	AVRG	<-
(3)	41883.000		0.01	-100.00	15.00	AVRG	<-
(4)	9451.3330		0.01	-100.00	15.00	AVRG	<-
(5)	21706.333		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	22276.500		0.01	-100.00	15.00	AVRG	<-
(2)	31436.500		0.01	-100.00	15.00	AVRG	<-
(3)	82979.000		0.01	-100.00	15.00	AVRG	<-
(4)	38179.000		0.01	-100.00	15.00	AVRG	<-
(5)	65154.500		0.01	-100.00	15.00	AVRG	<-

ND, no flag

FORM 7B
PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN34 Calibration Date: 12/17/02 Time: 1604

Lab File ID: 189ZAR1660XH Init. Calib. Date(s): 12/07/02 12/08/02

Init. Calib. Times: 2306 0958

GC Column: CLPEST ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF0.0200 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
Aldrin	1861960.0	1678550.0	0.01	-9.85	15.00	AVRG	
alpha-BHC	1929382.5	1756250.0	0.01	-8.97	15.00	AVRG	
beta-BHC	596651.25	545250.00	0.01	-8.61	15.00	AVRG	
delta-BHC	1838245.0	1682250.0	0.01	-8.49	15.00	AVRG	
gamma-BHC (Lindane)	1828942.5	1657400.0	0.01	-9.38	15.00	AVRG	
4,4'-DDD	1101938.1	1027843.8	0.01	-6.72	15.00	AVRG	
4,4'-DDE	1500515.0	1366275.0	0.01	-8.95	15.00	AVRG	
4,4'-DDT	782036.67	677925.00	0.01	-13.31	15.00	AVRG	
Dieldrin	1610876.3	1436962.5	0.01	-10.80	15.00	AVRG	
Endosulfan I	1500215.0	1329587.5	0.01	-11.37	15.00	AVRG	
Endosulfan II	1272820.0	1158875.0	0.01	-8.95	15.00	AVRG	
Endosulfan sulfate	1175517.5	1052468.8	0.01	-10.47	15.00	AVRG	
Endrin	1480122.5	1325793.8	0.01	-10.43	15.00	AVRG	
Endrin Aldehyde	1052303.8	953075.00	0.01	-9.43	15.00	AVRG	
Heptachlor	1922021.6	1752225.0	0.01	-8.83	15.00	AVRG	
Heptachlor Epoxide	1725150.0	1566050.0	0.01	-9.22	15.00	AVRG	
Methoxychlor	563996.25	475102.50	0.01	-15.76	15.00	AVRG	<-
Toxaphene	76963.750		0.01	-100.00	15.00	AVRG	<-
(2)	89922.000		0.01	-100.00	15.00	AVRG	<-
(3)	77498.000		0.01	-100.00	15.00	AVRG	<-
(4)	75316.000		0.01	-100.00	15.00	AVRG	<-
(5)	55141.750		0.01	-100.00	15.00	AVRG	<-
Aroclor-1016	11111.667	10134.333	0.01	-8.80	15.00	AVRG	
(2)	15485.067	14223.333	0.01	-8.15	15.00	AVRG	
(3)	27942.867	24982.667	0.01	-10.59	15.00	AVRG	
(4)	18003.400	17201.333	0.01	-4.46	15.00	AVRG	
(5)	12050.600	10991.333	0.01	-8.79	15.00	AVRG	
Aroclor-1221	3106.7500		0.01	-100.00	15.00	AVRG	<-
(2)	4799.2500		0.01	-100.00	15.00	AVRG	<-
(3)	3234.5000		0.01	-100.00	15.00	AVRG	<-
(4)	13000.750		0.01	-100.00	15.00	AVRG	<-
(5)	0.0000000		0.01	0.00	15.00	AVRG	<-
Aroclor-1232	13015.667		0.01	-100.00	15.00	AVRG	<-
(2)	6743.3330		0.01	-100.00	15.00	AVRG	<-
(3)	12216.000		0.01	-100.00	15.00	AVRG	<-
(4)	4879.6670		0.01	-100.00	15.00	AVRG	<-
(5)	9007.0000		0.01	-100.00	15.00	AVRG	<-
Aroclor-1242	9970.0000		0.01	-100.00	15.00	AVRG	<-
(2)	12706.500		0.01	-100.00	15.00	AVRG	<-
(3)	22825.500		0.01	-100.00	15.00	AVRG	<-
(4)	18079.500		0.01	-100.00	15.00	AVRG	<-
(5)	15341.000		0.01	-100.00	15.00	AVRG	<-

UJ, C

2F
SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

GC Column(1): CLPEST ID: 0.53 (mm) GC Column(2): CLPEST2 ID: 0.53 (mm)

	EPA SAMPLE NO.	S1 1 %REC	#	S1 2 %REC	#	TCX 1 %REC	#	TCX 2 %REC	#	OTHER (1)	OTHER (2)	TOT OUT
01	PBLKWJ	93		105		98		90				0
02	PCBLCSWJ	88		91		84		80				0
03	PLCSWJ	100		110		93		97				0
04	40SB13A	81		97		90		77				0
05	PBLKYB	89		92		87		90				0
06	PLCSYB	89		92		90		90				0
07	PCBLCSYB	87		88		82		84				0
08	TESTPIT1F	99		72		1900	D	79				0
09	TESTPIT1F2	40	*	33	*	59		40	*			3
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

ADVISORY
QC LIMITS

S1 = Decachlorobiphenyl (DC (43-144)
S2 (TCX) = Tetrachloro-m-Xylene (43-135)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

3F

SOIL PESTICIDE LAB CONTROL SAMPLE

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

COMPOUND	SPIKE ADDED (ug/Kg	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Aldrin	6.7	5.3	79	26-124
gamma-BHC (Lindane)	6.7	4.5	67	24-100
4,4'-DDT	17	22	130 *	37-128
Dieldrin	17	16	94	45-120
Endrin	17	14	82	39-103
Heptachlor	6.7	5.2	78	34-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 1 out of 6 outside limits

COMMENTS: _____

3F

SOIL PESTICIDE LAB CONTROL SAMPLE

Lab Name: COMPUCHEM Contract: PEST/PCB

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

COMPOUND	SPIKE ADDED (ug/Kg	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Aldrin	6.7	5.8	87	26-124
gamma-BHC (Lindane)	6.7	5.5	82	24-100
4,4'-DDT	17	23	140 *	37-128
Dieldrin	17	16	94	45-120
Endrin	17	15	88	39-103
Heptachlor	6.7	5.9	88	34-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 1 out of 6 outside limits

COMMENTS: _____

DATA VALIDATION WORKSHEET

PCBs

Reviewer: RA
Date: 2/10/03
DV Level: II III IV

Review Document:

X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

no flags

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: U27888
Test Name: PCB
Method No.: 8082

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: collect 11/19/02 extract 11/20/02 analyzed 11/27/02 11/22/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes: EBs in R2766 are ND

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? 1016 & 1260 require a minimum of three peaks and five concentrations. The remaining arochlors are required to run one standard during calibration.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			✓
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			

Notes:

5.0 Surrogate Recovery					Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?				✓		
5.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.				✓		
5.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?				✓		
5.4	If No in Section 5.3, are these sample(s) or method blank(s) reanalyzed?						✓
5.5	If No in Section 5.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)						✓
	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance			
	1 out	high/low	No action	No action			
	2 out	2 high same column	K	No action			
		2 low same column	L, UL	No action			
		mixed same column	J, UJ	No action			
		2 high diff columns	J	Not applicable			
		2 low diff columns	J, UJ	Not applicable			
		mixed diff columns	Professional judgement	Not applicable			
	3 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		2 high, 1 low	K (2 high)	J (1 low 2nd column)			
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)			
		other mixed	J, UJ	Not applicable			
	4 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		Mixed	J, UJ	Not applicable			
	If any recovery is >0% and <10% then L(+)/R(-).						
	If any recovery is 0% then R(+/-).						

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)? Generally, no action is taken on the basis of field duplicate results. Only discussed in the DV report.	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 405B13C D-6
all ND all ND

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).	✓		
9.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RA
Date: 2/5/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Compuchem
SDG No.: U2788
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

collected	extracted	analyzed
11/19/02	11/20/02	12/15/02, 12/12/02, 12/8/02
4	11/25/02	12/12/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			✓
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			✓
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		✓	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.	✓		
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: TESTPIT1F DF=50 5yr p-terphenyl 4307 50–150%
TESTPIT1F2 DF=20 " " 1607 "

DF 710 no flags

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		✓	

Notes: 40SB13C D-6 See attached comment only.

acenaphthene	380
Pyrene	380
Phenanthrene	390
anthracene	130

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes: several 740Y. → J/g
Note ⇒ acenaphthylene changed to ND in 405B13B since it was not confirmed.

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			
	% Completeness = _____			

Notes:

2F

SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

GC Column(1): LC-PAH ID: 4.60 (mm) GC Column(2): PAH-C16 ID: 4.60 (mm)

	EPA SAMPLE NO.	S1 1 %REC	#	S1 2 %REC	#	S2 1 %REC	#	S2 2 %REC	#	S3 1 %REC	#	S3 2 %REC	#	TOT OUT
01	PBLKWI	93		94										0
02	PLCSWI	94												0
03	D-6	99		94										0
04	PBLKXZ	100		98										0
05	PLCSXZ	100												0
06	40SB13C DF=50	430	D	128										0
07	TESTPIT1F DF=20	160	D	93										0
08	TESTPIT1F2	110		129										0
09	40SB13A	110		107										0
10	40SB13B	110		105										0
11														
12														
13														
14														
15														
16														
17														
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21														
22														
23														
24														
25														
26														
27														
28														
29														
30														

ADVISORY QC LIMITS

S1 = p-Terphenyl (50-150)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB13A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Lab Sample ID: U2788-1 Date(s) Analyzed: 12/13/02 12/15/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	15.67	15.13	16.13	35	
	2	13.80	13.37	14.37	85	83.3
Fluoranthene	1	15.09	14.55	15.55	64	
	2	13.04	12.57	13.57	38	51.0
Chrysene	1	16.97	16.45	17.45	8.0	
	2	16.93	16.48	17.48	310	189.9
Benzo(b)fluoranthene	1	18.56	18.07	19.07	18	
	2	18.69	18.30	19.30	25	32.6
Benzo(a)pyrene	1	19.35	18.82	19.82	22	
	2	20.59	20.20	21.20	10	75.0
	1					
	2					
	1					
	2					
	1					
	2					

	405B13C	RL	D_6	RPD
→ acenaphthene	380	51	51U	38074X51
→ pyrene	380	17	8.5	37176 1
→ Phenanthrene	390	51	51U	39074X51
anthracene	130	51	51U	OK✓
fluoranthene	540	17	16	54074X17
chrysene	390		140	94%
benzo(b)fluoranthene	84	10	10U	5474X10
benzo(K) ~ »	53		1.9	184%
benzo(g,h,i)perylene	44	10	10U	4474X10
benzo(a)anthracene	170		5.4	157%
benzo(a) Pyrene	89		7	170%
Indeno(1,2,3-cd)pyrene	56		3.1	179%

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB13B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Lab Sample ID: U2788-2 Date(s) Analyzed: 12/13/02 12/15/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): PAH-C16 ID: 4.60(mm) GC Column(2): LC-PAH ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	15.64	15.13	16.13	35	
	2	13.78	13.37	14.37	92	89.8
Fluoranthene	1	15.06	14.55	15.55	62	
	2	13.00	12.57	13.57	41	40.8
Chrysene	1	16.96	16.45	17.45	16	
	2	16.91	16.48	17.48	550	188.7
Benzo(b)fluoranthene	1	18.57	18.07	19.07	22	
	2	18.65	18.30	19.30	35	45.6
Benzo(a)pyrene	1	19.37	18.82	19.82	33	
	2	20.50	20.20	21.20	14	80.8
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Lab Sample ID: U2788-3 Date(s) Analyzed: 12/12/02 12/13/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Acenaphthene	1	9.65	9.28	10.28	380	
	2	11.44	11.00	12.00	78	131.9
Pyrene	1	13.97	13.51	14.51	380	
	2	15.65	15.13	16.13	430	12.3
Phenanthrene	1	11.20	10.71	11.71	390	
	2	13.63	13.11	14.11	420	7.4
Anthracene	1	12.23	11.77	12.77	130	
	2	14.04	13.53	14.53	120	8.0
Fluoranthene	1	13.18	12.71	13.71	540	
	2	15.05	14.55	15.55	800	38.8
Chrysene	1	17.06	16.69	17.69	390	
	2	16.98	16.45	17.45	150	88.9
Benzo(b)fluoranthene	1	19.00	18.58	19.58	84	
	2	18.60	18.07	19.07	140	50.0
Benzo(k)fluoranthene	1	20.04	19.62	20.62	53	
	2	18.78	18.22	19.22	160	100.5

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

40SB13C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Lab Sample ID: U2788-3 Date(s) Analyzed: 12/12/02 12/13/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Benzo(g,h,i)perylene	1	23.76	23.29	24.29	44	
	2	21.28	20.70	21.70	60	30.8
Benzo(a)anthracene	1	16.41	15.99	16.99	170	
	2	16.98	16.45	17.45	150	12.5
Benzo(a)pyrene	1	21.00	20.57	21.57	89	
	2	19.36	18.82	19.82	100	11.6
Indeno(1,2,3-cd)pyrene	1	24.78	24.31	25.31	56	
	2	20.79	20.36	21.36	550	163.0
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

FORM X PEST-1

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

D-6

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Lab Sample ID: U2788-4 Date(s) Analyzed: 12/08/02 12/13/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.57	13.05	14.05	8.5	
	2	15.66	15.13	16.13	8.6	1.2
Fluoranthene	1	12.80	12.22	13.22	16	
	2	15.07	14.55	15.55	22	31.6
Chrysene	1	16.73	16.27	17.27	140	
	2	16.95	16.45	17.45	3.0	191.6
Benzo(k)fluoranthene	1	19.60	19.20	20.20	1.9	
	2	18.73	18.22	19.22	2.5	27.3
Benzo(a)anthracene	1	16.02	15.56	16.56	5.4	
	2	16.95	16.45	17.45	3.0	57.1
Benzo(a)pyrene	1	20.54	20.13	21.13	7.0	
	2	19.36	18.82	19.82	8.0	13.3
Indeno(1,2,3-cd)pyrene	1	24.04	23.65	24.65	3.1	
	2	20.70	20.36	21.36	240	194.9
	1					
	2					

FORM X PEST-1

10A
PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

TESTPIT1F

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Lab Sample ID: U2788-5 Date(s) Analyzed: 12/12/02 12/13/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Pyrene	1	13.86	13.51	14.51	650	
	2	15.73	15.13	16.13	340	62.6
Fluoranthene	1	13.18	12.71	13.71	380	
	2	15.12	14.55	15.55	990	89.0
Chrysene	1	17.05	16.69	17.69	2800	
	2	17.02	16.45	17.45	56	192.2
Benzo(b)fluoranthene	1	18.78	18.58	19.58	330	
	2	18.59	18.07	19.07	92	112.8
Acenaphthylene	1	8.67	7.95	8.95	4100	
	2	12.82	12.23	13.23	56	194.6
	1					
	2					
	1					
	2					
	1					
	2					

10A

PESTICIDE IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

EPA SAMPLE NO.

TESTPIT1F2

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Lab Sample ID: U2788-6 Date(s) Analyzed: 12/12/02 12/13/02

Instrument ID (1): VARIAN76 Instrument ID (2): VARIAN76

GC Column(1): LC-PAH ID: 4.60(mm) GC Column(2): PAH-C16 ID: 4.60(mm)

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	RPD
Naphthalene	1	7.78	6.93	7.93	420	
	2	10.63	10.00	11.00	38	166.8
Pyrene	1	14.03	13.51	14.51	170	
	2	15.64	15.13	16.13	110	42.8
Fluoranthene	1	13.23	12.71	13.71	220	
	2	15.04	14.55	15.55	490	76.0
Chrysene	1	17.02	16.69	17.69	2600	
	2	16.93	16.45	17.45	23	196.5
Benzo(a)anthracene	1	16.59	15.99	16.99	1200	
	2	16.93	16.45	17.45	23	192.5
Acenaphthylene	1	8.71	7.95	8.95	980	
	2	12.80	12.23	13.23	18	192.8
	1					
	2					
	1					
	2					

40171

DATA VALIDATION WORKSHEET

~~Nitroglycerin~~ Explosives

Reviewer: AJ
Date: 01/27/03
DV Level: II III IV
Review Document:
_X_ Region III Modified for National Functional Guidelines
___ NFG for organic Data review (February 1994)
___ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: U2788
Test Name: ~~Nitroglycerin~~ EXP.
Method No.: ~~8332-HPLC~~ 8330 HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: COC ID'S: 1097, 1098

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: Cooler temps: 2.0°C, 2.7°C

sampled: 11/19/02, 11/20/02
extracted: 11/21/02, 11/26/02
analysis: 12/03/02, 12/04/02

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			X

Notes: NO equipment/field blanks submitted.

4.0 Initial and Continuing Calibration

		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		X	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes: ICAL: ROX %RSD 51.7% - All ND's - SO will flag ROX UJ, r
CCAL: 020HFULL4GD: HMX %D 27.02%, 2,4,6-TNT %D 20.87 - No action taken, all ND.
ROX %D -26.87% - UJ, C

5.0 Surrogate Recovery

		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? 50-150%	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?		X	
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?		X	
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			X
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			X
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: NO MS/MSD set submitted in this batch.

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits? 50-150% - in house used		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.	X		

Notes: Field Dup D-6 of 405B13C - All ND's.

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 6			
10.1.3	Number of results rejected and not reported: ∅			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			
	% Completeness = 100%			

Notes:

FORM 6
8330 INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN74 Calibration Date(s): 12/03/02 12/03/02

Column: C18 ID: 3.90 (mm) Calibration Time(s): 0133 0439

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2
HMX	AVRG	1297.24800	17.6
1,3,5-Trinitrobenzene	AVRG	4352.48320	3.9
RDX	AVRG	2468.55040	51.7 ←
1,3-Dinitrobenzene	AVRG	5174.72640	4.6
2,4,6-Trinitrotoluene	AVRG	1325.15200	9.7
Tetryl	AVRG	2891.65440	3.8
Nitrobenzene	AVRG	5783.30880	3.8
2,4-Dinitrotoluene	AVRG	4688.85760	4.7
2,6-Dinitrotoluene	AVRG	2325.08960	7.6
2-Amino-4,6-dinitrotoluene	AVRG	3425.08000	3.2
4-Amino-2,6-dinitrotoluene	AVRG	2309.55840	7.1
2-Nitrotoluene	AVRG	2101.16000	3.5
4-Nitrotoluene	AVRG	1735.74720	6.6
3-Nitrotoluene	AVRG	2236.08800	4.0
1,4-Dinitrobenzene	AVRG	4070.83040	3.7

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN74 Calibration Date: 12/03/02 Time: 1529

Lab File ID: 020HFULL4GD Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1647.7120	0.01	27.02	15.00	AVRG	<-
1,3,5-Trinitrobenzene	4352.4830	4536.7360	0.01	4.23	15.00	AVRG	
RDX	2468.5500	1805.1520	0.01	-26.87	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5414.3360	0.01	4.63	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1601.6960	0.01	20.87	15.00	AVRG	<-
Tetryl	2891.6540	2815.9520	0.01	-2.62	15.00	AVRG	
Nitrobenzene	5783.3090	5631.9040	0.01	-2.62	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	5065.4080	0.01	8.03	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2478.8640	0.01	6.61	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3684.9120	0.01	7.59	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2426.6240	0.01	5.07	15.00	AVRG	
2-Nitrotoluene	2101.1600	2215.0240	0.01	5.42	15.00	AVRG	
4-Nitrotoluene	1735.7470	1885.8080	0.01	8.64	15.00	AVRG	
3-Nitrotoluene	2236.0880	2385.7760	0.01	6.69	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4232.4480	0.01	3.97	15.00	AVRG	

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN74 Calibration Date: 12/04/02 Time: 0001

Lab File ID: 031HFULL4GE Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1672.9920	0.01	28.96	15.00	AVRG	<-
1,3,5-Trinitrobenzene	4352.4830	4560.4160	0.01	4.78	15.00	AVRG	
RDX	2468.5500	1843.5520	0.01	-25.32	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5478.6880	0.01	5.87	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1666.8480	0.01	25.78	15.00	AVRG	<-
Tetryl	2891.6540	2937.9200	0.01	1.60	15.00	AVRG	
Nitrobenzene	5783.3090	5875.8400	0.01	1.60	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	5048.8640	0.01	7.68	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2500.5120	0.01	7.54	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3733.8400	0.01	9.01	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2460.8160	0.01	6.55	15.00	AVRG	
2-Nitrotoluene	2101.1600	2228.7680	0.01	6.07	15.00	AVRG	
4-Nitrotoluene	1735.7470	1891.6640	0.01	8.98	15.00	AVRG	
3-Nitrotoluene	2236.0880	2385.0240	0.01	6.66	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4293.2160	0.01	5.46	15.00	AVRG	

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN74 Calibration Date: 12/04/02 Time: 0918

Lab File ID: 043HFULL4GF Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1387.8080	0.01	6.98	15.00	AVRG	
1,3,5-Trinitrobenzene	4352.4830	4674.5920	0.01	7.40	15.00	AVRG	
RDX	2468.5500	1825.9200	0.01	-26.03	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5675.4240	0.01	9.68	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1507.0080	0.01	13.72	15.00	AVRG	
Tetryl	2891.6540	2728.5920	0.01	-5.64	15.00	AVRG	
Nitrobenzene	5783.3090	5457.1840	0.01	-5.64	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	5280.0640	0.01	12.61	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2513.5040	0.01	8.10	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3715.8720	0.01	8.49	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2375.5520	0.01	2.86	15.00	AVRG	
2-Nitrotoluene	2101.1600	2295.7600	0.01	9.26	15.00	AVRG	
4-Nitrotoluene	1735.7470	1939.0880	0.01	11.71	15.00	AVRG	
3-Nitrotoluene	2236.0880	2431.9680	0.01	8.76	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4496.0720	0.01	10.45	15.00	AVRG	

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN74 Calibration Date: 12/04/02 Time: 1427

Lab File ID: 044HFULLGH Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	RRF OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1292.0640	0.01	-0.40	15.00	AVRG	
1,3,5-Trinitrobenzene	4352.4830	4278.5280	0.01	-1.70	15.00	AVRG	
RDX	2468.5500	1671.6480	0.01	-32.28	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5345.3440	0.01	3.30	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1199.9680	0.01	-9.45	15.00	AVRG	
Tetryl	2891.6540	2977.8080	0.01	2.98	15.00	AVRG	
Nitrobenzene	5783.3090	5955.6160	0.01	2.98	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	4702.8160	0.01	0.30	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2401.2160	0.01	3.27	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3425.1680	0.01	0.00	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2310.9920	0.01	0.06	15.00	AVRG	
2-Nitrotoluene	2101.1600	2158.9600	0.01	2.75	15.00	AVRG	
4-Nitrotoluene	1735.7470	1832.2400	0.01	5.56	15.00	AVRG	
3-Nitrotoluene	2236.0880	2317.3920	0.01	3.64	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4285.4880	0.01	5.27	15.00	AVRG	

FORM 7B
8330 CALIBRATION VERIFICATION SUMMARY

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: U2788

Instrument ID: VARIAN74 Calibration Date: 12/04/02 Time: 2258

Lab File ID: 055HFULL4GI Init. Calib. Date(s): 12/03/02 12/03/02

Init. Calib. Times: 0133 0439

GC Column: C18 ID: 3.90 (mm)

COMPOUND	$\overline{\text{RRF}}$ OR AMOUNT	RRF31.250 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE	
HMX	1297.2480	1642.9440	0.01	26.65	15.00	AVRG	<-
1,3,5-Trinitrobenzene	4352.4830	4744.0320	0.01	9.00	15.00	AVRG	
RDX	2468.5500	1774.4960	0.01	-28.12	15.00	AVRG	<-
1,3-Dinitrobenzene	5174.7260	5445.1200	0.01	5.22	15.00	AVRG	
2,4,6-Trinitrotoluene	1325.1520	1508.8640	0.01	13.86	15.00	AVRG	
Tetryl	2891.6540	2972.5600	0.01	2.80	15.00	AVRG	
Nitrobenzene	5783.3090	5945.1200	0.01	2.80	15.00	AVRG	
2,4-Dinitrotoluene	4688.8580	5032.1600	0.01	7.32	15.00	AVRG	
2,6-Dinitrotoluene	2325.0900	2422.3040	0.01	4.18	15.00	AVRG	
2-Amino-4,6-dinitrotoluene	3425.0800	3636.1280	0.01	6.16	15.00	AVRG	
4-Amino-2,6-dinitrotoluene	2309.5580	2439.8240	0.01	5.64	15.00	AVRG	
2-Nitrotoluene	2101.1600	2201.2000	0.01	4.76	15.00	AVRG	
4-Nitrotoluene	1735.7470	1870.7360	0.01	7.78	15.00	AVRG	
3-Nitrotoluene	2236.0880	2359.7280	0.01	5.53	15.00	AVRG	
1,4-Dinitrobenzene	4070.8300	4385.3200	0.01	7.72	15.00	AVRG	

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: AJ
Date: 01/29/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: U2788
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: Cooler temps: 2.0°C, 2.7°C

sampled 11/19/02, 11/20/02
extracted 11/21/02, 11/26/02
analysis 11/26/02, 12/02/02, 12/08/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.		X	

Notes: ~~No field/equipment blanks submitted in this package.~~ in SDG R27888 all ND EAV

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			X
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			X
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? 50-150%	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?		X	
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?		X	
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			X
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			X
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: NO MS/MSD set in this batch

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: NO LCSD

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: D-6 is a dup of 405B13C - both non-detect

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	X		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes: Test Pit IF had a positive hit - confirmed on column "Pinnacle Cyano" on 12

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 6			
10.1.3	Number of results rejected and not reported: Ø			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100			
	% Completeness = 100			

Notes:

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1098

Project Number	Project Name
07604-258	RFAAP

Project Contact (Name and Phone Number): Darren Reeve

Samplers: Fisher/Spangler

LAB: 52

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
Test Pit 1F	11/20/02 1110	5		X	9	E		4		X	X	X	X	Y		X							Glass present
Test Pit 1F2	11/20/02 1250	5		X	9	E		4		X	X	X	X	X		X							
Test Pit 2F	11/20/02 1400	5		X	9	E		4		X	X	X	X	X		X							
Test Pit 2F MS	11/20/02 1400	5		X	9	E		4		X	X	X	X	X		X							
Test Pit 2F SD	11/20/02 1400	5		X	9	E		4		X	X	X	X	X		X							
Test Pit 2BF	11/20/02 1500	5		X	9	E		4		X	X	X	X	Y		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Scott Linton	11/20/02-1800				
Relinquished by:	Date/time	Received by: (for lab) Marcine J Bell	Date/Time 11-21-02 9:00	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.7°C

Radford Army Ammunition Plant
Chain Of Custody Record

No 1097

Project Number	Project Name
07604-258	RFAAP

Project Contact (Name and Phone Number): Darren Reneke

Samplers: Fisher / Spangler

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan (8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)
403615A	11/19/02 915	5		1	9	E		4		X	X	X	X	X		X						
403613B	11/19/02 930	5		X	9	E		3		X	X		X	X		X						
403615C	11/19/02 945	5		X	9	E		3		X	X		X	X		X						
D-6	11/19/02	5		X	9	E		3		X	X		X	X		X						

LAB:

AIRBILL No:

Courier:

REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Butch Lin 11/19/02	1800				2.0°C
Relinquished by:	Date/time	Received by: (for lab) Liz Schaffer	Date/Time 11/20/02 @ 0900	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: U2788
Project No.: 15295137.10000

Project Name: Radford SWMU 40/71
Reviewer: RA
Date: 2/10/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{o}C \pm 2\ ^{o}C$)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: collected 11/19/02 " analyzed 12/4/02 Hg 12/5/02 ICP

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%? <50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K		✓				

Note:
aluminum 299.5% det 2xCRDL
antimony 77.1 ~~Ht~~ L,W R,M
arsenic 72.8 det 2xCRDL
cadmium 113.8 K,W
calcium 123.5
copper 78.2
iron 69.7
lead 75.3
mg 117.3
se 137.4 K,W
Sodium 79.3 ~~L,W~~ B,C
Thallium 85.8 ~~Ht~~ R,M

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L						
4.5	Are there reported field blankor trip blank values > ± MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						

Note: EQB in RZ788 Pos → Ba, Cu, Fe, Ca, Na Pos Sodium < 5x → B, Zx all others > 5x
MB → Pos Ba, Mg, zinc all 75x in samples no flag
ICB, CCB neg As → Lio in all samples
Pos. ba, Mg, beryllium, calcium all 75x, no flags

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes < -IDL L(+)/UL(-) > IDL K(+) Spiked analytes (ICS AB analytes) < 50% L(+)/R(-) 50% - 79% L(+)/UL(-) >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.		✓		✓		

Note: Copper 47.5%. Zinc 40.2%. all pos → J, K

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓		
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L						
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required	✓					✓

Note: antimony 25.7 / 29.4 R,M / Thallium 6.7 / 8.5 (R,M) in all
arsenic 56.6 prev. LTO
Se 63.6 L,M unless prev. V 127.1 K,M in all

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?						

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note: zinc 19.4%. all prev flagged for lab dup.

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		✓			✓	

Note: See attached
RPD > QC for Al, Ca, Cobalt, Mg, Mn, Nickel, Potassium

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓		
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note:

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples: 6						
13.1.2	Number of target compounds in each analysis: 23						
13.1.3	Number of results rejected and not reported: 11						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 92%						

Note:

	405B13C		D-6	RPD
al	15000	RL	22700	40%
As	4.7	10	2.2 OKV	
Ba	47		44.8 OKV	
Be	.155	5	1.0 OKV	
Cd	.15		.21 OKV	
Ca	33400		61800	59%
Cr	27.6		29.8	8% OKV
Co	6.6		43.1	146%
Cu	7.5		7.5 OKV	
Fe	23600		25600	8% OK
lead	16.8		15.4 OKV	
Mg	9760		27600	95%
Mn	180		791	125%
Hg	.063	.2	.027 OKV	
nickel	7.3		74.9	164%
K	1840		5600	101%
Se	3.4	5	.7 OKV	
Ag	.16	5	ND OKV	
V	46	20	59.1 OK	
Zn	27.7	20	44.4 OKV	

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-7

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-14

Level (low/med): LOW Date Received: 11/20/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.32	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	UL/W
7440-47-3	Chromium	1.9	B		P	B.O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.7	B		P	L/W
7439-89-6	Iron	13.3	B		P	
7439-92-1	Lead	1.2	U		P	UL/W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.70	B		P	B.O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	48.0	B		P	L/W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.7	B		P	B.O
7440-23-5	Sodium	929	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	UL/W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

S

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-8

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2788

Matrix (soil/water): WATER Lab Sample ID: R2788-16

Level (low/med): LOW Date Received: 11/21/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	56.7	U		P	
7440-36-0	Antimony	1.2	U		P	
7440-38-2	Arsenic	3.0	U		P	
7440-39-3	Barium	0.33	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	15.0	U		P	VL/W
7440-47-3	Chromium	2.0	B		P	B,O
7440-48-4	Cobalt	0.70	U		P	
7440-50-8	Copper	1.5	U		P	VL/W
7439-89-6	Iron	15.7	B		P	
7439-92-1	Lead	1.2	U		P	VL/W
7439-95-4	Magnesium	12.3	U		P	
7439-96-5	Manganese	0.61	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	40.7	B		P	L/W
7782-49-2	Selenium	3.0	U		P	
7440-22-4	Silver	2.7	B		P	B,O
7440-23-5	Sodium	1110	B		P	
7440-28-0	Thallium	2.4	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	U		P	VL/W

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

S

SW846 METALS

2B-IN

CRDL STANDARD FOR AA AND ICP

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: U2788

AA CRDL Standard Source: HIPUR

ICP CRDL Standard Source: HIPUR

Concentration Units: ug/L

Analyte	True	Found	%R	CRDL Standard for ICP Initial True	Initial Found	Initial %R	Final Found	Final %R
Aluminum				100.0	299.49	299.5		
Antimony				10.0	7.71	77.1		
Arsenic				10.0	7.28	72.8		
Barium				10.0	10.32	103.2		
Beryllium				5.0	5.12	102.4		
Cadmium				5.0	5.69	113.8		
Calcium				1000.0	1235.40	123.5		
Chromium				5.0	5.25	105.0		
Cobalt				5.0	5.07	101.4		
Copper				5.0	3.91	78.2		
Iron				100.0	169.72	169.7		
Lead				3.0	2.26	75.3		
Magnesium				1000.0	1172.57	117.3		
Manganese				10.0	9.97	99.7		
Mercury	0.2	0.21	105.0					
Nickel				5.0	5.23	104.6		
Potassium				1000.0	1093.12	109.3		
Selenium				5.0	6.87	137.4		
Silver				5.0	5.43	108.6		
Sodium				2000.0	1585.60	79.3		
Thallium				10.0	8.58	85.8		
Vanadium				20.0	19.65	98.2		
Zinc				20.0	21.16	105.8		

Control Limits: no limits have been established by EPA at this time

SW846 METALS

3

BLANKS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: U2788

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	21.8	U	21.8	U	21.8	U	21.8	U	2.180	U	P
Antimony	3.7	U	3.7	U	3.7	U	3.7	U	0.370	U	P
Arsenic	2.5	U	2.5	U	-3.6	B	-3.1	B	0.250	U	P
Barium	0.4	B	0.5	B	0.5	B	0.6	B	0.043	B	P
Beryllium	0.1	U	0.1	U	0.1	U	0.1	B	0.010	U	P
Cadmium	0.4	U	0.4	U	0.4	U	0.4	U	0.040	U	P
Calcium	9.6	U	9.6	U	9.6	U	19.3	B	0.960	U	P
Chromium	0.6	U	0.6	U	0.6	U	0.6	U	0.060	U	P
Cobalt	0.6	U	0.6	U	0.6	U	0.6	U	0.060	U	P
Copper	1.4	U	1.4	U	1.4	U	1.4	U	0.140	U	P
Iron	13.7	U	13.7	U	13.7	U	13.7	U	1.370	U	P
Lead	2.3	U	2.3	U	2.3	U	2.3	U	0.230	U	P
Magnesium	58.3	B	67.6	B	66.1	B	82.2	B	6.361	B	P
Manganese	0.2	U	0.2	U	0.2	U	0.2	U	0.020	U	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.017	U	CV
Nickel	1.0	U	1.0	U	1.0	U	1.0	U	0.100	U	P
Potassium	118.5	U	118.5	U	118.5	U	118.5	U	11.850	U	P
Selenium	3.3	U	3.3	U	3.3	U	3.3	U	0.330	U	P
Silver	0.7	U	0.7	U	0.7	U	0.7	U	0.070	U	P
Sodium	248.7	U	248.7	U	248.7	U	248.7	U	24.870	U	P
Thallium	5.1	U	5.1	U	5.1	U	5.1	U	0.510	U	P
Vanadium	0.7	U	0.7	U	0.7	U	0.7	U	0.070	U	P
Zinc	1.0	U	1.0	U	1.0	U	1.0	U	0.245	B	P

SW846 METALS

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DUPLICATES

SAMPLE NO.

40SB13AD

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 85.0 % Solids for Duplicate: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		12247.9199		12873.0498		5.0		P
Antimony		0.4353	U	0.4353	U			P
Arsenic	1.2	2.8193		3.1036		9.6		P
Barium		37.6600		41.0078		8.5		P
Beryllium		0.3440	B	0.3863	B	11.6		P
Cadmium		0.0471	U	0.0471	U			P
Calcium		4104.7349		5446.4849		28.1	*	P
Chromium		18.2133		17.4673		4.2		P
Cobalt		6.1293		7.4305		19.2		P
Copper	0.6	2.5847		4.1965		47.5	*	P
Iron		23040.8809		24241.6504		5.1		P
Lead		15.0092		16.6867		10.6		P
Magnesium		2276.1631		2920.6541		24.8	*	P
Manganese		266.0025		284.8157		6.8		P
Mercury	0.0	0.0462		0.0689		39.4		CV
Nickel		4.8341		5.4662		12.3		P
Potassium	117.6	578.9874		664.5452		13.8		P
Selenium	0.6	1.6037		1.6141		0.6		P
Silver		0.1226	B	0.1294	B	5.4		P
Sodium		123.7826	B	131.9712	B	6.4		P
Thallium		0.6000	U	0.6000	U			P
Vanadium		40.7160		41.8744		2.8		P
Zinc		18.9214		28.4546		40.2	*	P

SW846 METALS

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

40SB13AS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: U2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	15.0890		0.4353	U	58.82	25.7	N	P
Arsenic	75 - 125	5.4854		2.8193		4.71	56.6	N	P
Barium	75 - 125	252.7379		37.6600		235.29	91.4		P
Beryllium	75 - 125	5.5327		0.3440	B	5.88	88.2		P
Cadmium	75 - 125	4.8276		0.0471	U	5.88	82.1		P
Chromium	75 - 125	43.3822		18.2133		23.53	107.0		P
Cobalt	75 - 125	59.6364		6.1293		58.82	91.0		P
Copper	75 - 125	30.7351		2.5847		29.41	95.7		P
Lead		15.5040		15.0092		2.35	21.1		P
Manganese		249.1944		266.0025		58.82	-28.6		P
Mercury	75 - 125	0.2416		0.0462		0.20	97.7		CV
Nickel	75 - 125	57.5404		4.8341		58.82	89.6		P
Selenium	75 - 125	2.3539		1.6037		1.18	63.6	N	P
Silver	75 - 125	5.2878		0.1226	B	5.88	87.8		P
Thallium	75 - 125	0.6000	U	0.6000	U	5.88	-6.7	N	P
Vanadium	75 - 125	115.4624		40.7160		58.82	127.1	N	P
Zinc	75 - 125	86.1249		18.9214		58.82	114.3		P

Comments:

SW846 METALS

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

40SB13ASD

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	17.2807		0.4353	U	58.82	29.4	N	P
Arsenic	75 - 125	7.2181		2.8193		4.71	93.4		P
Barium	75 - 125	251.5690		37.6600		235.29	90.9		P
Beryllium	75 - 125	5.7525		0.3440	B	5.88	92.0		P
Cadmium	75 - 125	5.1490		0.0471	U	5.88	87.6		P
Chromium	75 - 125	43.3725		18.2133		23.53	106.9		P
Cobalt	75 - 125	59.8254		6.1293		58.82	91.3		P
Copper	75 - 125	30.4134		2.5847		29.41	94.6		P
Lead		21.0907		15.0092		2.35	258.8		P
Manganese		262.7760		266.0025		58.82	-5.5		P
Mercury	75 - 125	0.2633		0.0462		0.20	108.6		CV
Nickel	75 - 125	58.6410		4.8341		58.82	91.5		P
Selenium	75 - 125	2.8108		1.6037		1.18	102.3		P
Silver	75 - 125	5.4439		0.1226	B	5.88	90.5		P
Thallium	75 - 125	0.6000	U	0.6000	U	5.88	8.5	N	P
Vanadium	75 - 125	101.7572		40.7160		58.82	103.8		P
Zinc	75 - 125	80.5069		18.9214		58.82	104.7		P

Comments:

9
ICP SERIAL DILUTIONS

SAMPLE NO.

40SB13AL

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2788

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	104107.30		111668.30		7.3		P
Antimony	3.70	U	18.50	U			P
Arsenic	23.96		12.50	U	100.0		P
Barium	320.11		330.52		3.3		P
Beryllium	2.92	B	2.85	B	2.4		P
Cadmium	0.40	U	2.00	U			P
Calcium	34890.25		37433.46		7.3		P
Chromium	154.81		160.91		3.9		P
Cobalt	52.10		55.18		5.9		P
Copper	21.97		37.65		71.4		P
Iron	195847.50		207054.80		5.7		P
Lead	127.58		138.41		8.5		P
Magnesium	19347.38		20935.63		8.2		P
Manganese	2261.02		2341.42		3.6		P
Nickel	41.09		43.06		4.8		P
Potassium	4921.39		5195.52		5.6		P
Selenium	13.63		27.24		99.9		P
Silver	1.04	B	3.50	U	100.0		P
Sodium	1052.15	B	1556.82	B	48.0		P
Thallium	5.10	U	25.50	U			P
Vanadium	346.09		352.89		2.0		P
Zinc	160.83		192.06		19.4	E	P

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 58885_(Revision 1) **Fraction:** Dioxin/Furan

Lab: Triangle **Project Name:** Radford SWMU 40/71_

Reviewer: Andrea_Sansom **Date:** April 17, 2003

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The laboratory flag "X" indicates that the associated PCDF peak/s has the same retention time as the associated diphenyl ether and that the diphenyl ether contribution to the total PCDF value is greater than ten percent. All PCDF results that were influenced by this co-elution have been reported as estimate maximum possible concentrations and were flagged "J,w".

Correctable Anomalies: The laboratory misinterpreted the field sample identifications as "55" or "5B" instead of "SS" or "SB"; the data validator manually correctly the identifications on the result forms.

Comments: The positive detection for sample 71SB11 for 2,3,7,8-TCDF on the DB-5 column was re-analyzed on a DB-225 column that is more suitable for determination of this congener. The DB-225 result for this congener should be used for data interpretation. This concentration has been appropriately used to determine the toxicity equivalent factor.

The laboratory flag "J" represents a reported concentration that was less than the linear range of the initial calibration and an estimate sample result.

Signed: Andrea Sansom

URS Group, Inc.

TLI Project: 58885 — Method 8290 PCDD/PCDF Analysis (b)

Client Sample: ~~40554~~ 40554 AL 2/26/03 — Analysis File: **S025901**

Client Project:	09604-258/RFAAPSWMU#40/71				
Sample Matrix:	SOIL	Date Received:	11/12/2002	Spike File:	SPMIT32S
TLI ID:	340-77-1	Date Extracted:	11/14/2002	ICal:	SF56072
		Date Analyzed:	11/19/2002	ConCal:	S025892
Sample Size:	15.600 g	Dilution Factor:	n/a	% Moisture:	35.6
Dry Weight:	10.046 g	Blank File:	S025881	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	64.4

Analytes	Conc. (pg/g)	DL	EMPC		Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.3					___
1,2,3,7,8-PeCDD	EMPC		1.3				J__
1,2,3,4,7,8-HxCDD	EMPC		2.1				J__
1,2,3,6,7,8-HxCDD	6.3				1.20	34:15	___
1,2,3,7,8,9-HxCDD	5.5				1.10	34:34	___
1,2,3,4,6,7,8-HpCDD	218				1.05	37:31	___
1,2,3,4,6,7,8,9-OCDD	1640				0.86	41:12	___
2,3,7,8-TCDF	ND	0.3					___
1,2,3,7,8-PeCDF	EMPC		11.5	J, w			X__
2,3,4,7,8-PeCDF	0.37				1.43	30:44	J__
1,2,3,4,7,8-HxCDF	EMPC		2.4				J__
1,2,3,6,7,8-HxCDF	2.0				1.28	33:33	J__
2,3,4,6,7,8-HxCDF	3.1				1.43	34:03	J__
1,2,3,7,8,9-HxCDF	ND	0.5					___
1,2,3,4,6,7,8-HpCDF	48.2				1.14	36:28	___
1,2,3,4,7,8,9-HpCDF	4.6				1.08	38:01	J__
1,2,3,4,6,7,8,9-OCDF	151				0.86	41:23	___

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	ND		0.3			___
Total PeCDD	EMPC			2.7		___
Total HxCDD	42.2	6		44.3		___
Total HpCDD	384	2				___
Total TCDF	3.5	1		4.1	J, w	X__
Total PeCDF	9.9	4		29.0	J, w	X__
Total HxCDF	51.0	6		127	J, w	X__
Total HpCDF	155	3		183	J, w	X__

MIT3_PSR v1.00, LARS 6.25.05

Triangle Laboratories, Inc.®
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Phone: (919) 544-5729 • Fax: (919) 544-5491

Printed: 09:10 11/20/2002

URS Group, Inc.

TLI Project: **58885**
Client Sample: ~~**40554**~~ Yoss1
JL 2/26/03

Toxicity Equivalents Report
Analysis File: **S025901**

Client Project:	09604-258/RFAAPSWMU#40/71				
Sample Matrix:	SOIL	Date Received:	11/12/02	Spike File:	SPMIT32S
TLI ID:	340-77-1	Date Extracted:	11/14/02	ICal:	SF56072
		Date Analyzed:	11/19/02	ConCal:	S025892
Sample Size:	15.600 g	Dilution Factor:	1	% Moisture:	35.6
Dry Weight:	10.046 g	Blank File:	S025881	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	64.4

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.3}	x	1.	=	0.3
1,2,3,7,8-PeCDD	[1.3]	x	0.5	=	0.65
1,2,3,4,7,8-HxCDD	[2.1]	x	0.1	=	0.21
1,2,3,6,7,8-HxCDD	6.3	x	0.1	=	0.63
1,2,3,7,8,9-HxCDD	5.5	x	0.1	=	0.55
1,2,3,4,6,7,8-HpCDD	218	x	0.01	=	2.18
1,2,3,4,6,7,8,9-OCDD	1640	x	0.001	=	1.640
TOTAL PCDD					6.2
2,3,7,8-TCDF	{0.3}	x	0.1	=	0.03
1,2,3,7,8-PeCDF	[11.5]	x	0.05	=	0.575
2,3,4,7,8-PeCDF	0.37	x	0.5	=	0.19
1,2,3,4,7,8-HxCDF	[2.4]	x	0.1	=	0.24
1,2,3,6,7,8-HxCDF	2.0	x	0.1	=	0.20
2,3,4,6,7,8-HxCDF	3.1	x	0.1	=	0.31
1,2,3,7,8,9-HxCDF	{0.5}	x	0.1	=	0.05
1,2,3,4,6,7,8-HpCDF	48.2	x	0.01	=	0.482
1,2,3,4,7,8,9-HpCDF	4.6	x	0.01	=	0.046
1,2,3,4,6,7,8,9-OCDF	151	x	0.001	=	0.151
TOTAL PCDF					2.27

Total EPA TEFs, 1989a: 8.4 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

GRY_TEF v1.08, MILES 4.22.16

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URS Group, Inc.

TLI Project: 58885
Client Sample: ~~40555~~ 40555 SS 5
JS 2/26/03

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: **S025902**

Client Project:	09604-258/RFAAPSWMU#40/71				
Sample Matrix:	SOIL	Date Received:	11/12/2002	Spike File:	SPMIT32S
TLI ID:	340-77-2	Date Extracted:	11/14/2002	ICal:	SF56072
		Date Analyzed:	11/19/2002	ConCal:	S025892
Sample Size:	13.100 g	Dilution Factor:	n/a	% Moisture:	23.1
Dry Weight:	10.074 g	Blank File:	S025881	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	76.9

Analytes	Conc. (pg/g)	DL	EMPC		Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.3					___
1,2,3,7,8-PeCDD	ND	0.4					___
1,2,3,4,7,8-HxCDD	ND	0.5					___
1,2,3,6,7,8-HxCDD	ND	0.6					___
1,2,3,7,8,9-HxCDD	ND	0.5					___
1,2,3,4,6,7,8-HpCDD	26.6				1.08	37:32	___
1,2,3,4,6,7,8,9-OCDD	248				0.86	41:13	___
2,3,7,8-TCDF	ND	0.3					___
1,2,3,7,8-PeCDF	EMPC		0.79	J,3			XJ_
2,3,4,7,8-PeCDF	ND	0.3					___
1,2,3,4,7,8-HxCDF	ND	0.3					___
1,2,3,6,7,8-HxCDF	ND	0.3					___
2,3,4,6,7,8-HxCDF	ND	0.4					___
1,2,3,7,8,9-HxCDF	ND	0.4					___
1,2,3,4,6,7,8-HpCDF	4.0				1.07	36:29	J__
1,2,3,4,7,8,9-HpCDF	ND	0.6					___
1,2,3,4,6,7,8,9-OCDF	13.6				0.93	41:25	___

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	ND		0.3			___
Total PeCDD	ND		0.4			___
Total HxCDD	3.4	2		5.1		___
Total HpCDD	103	2				___
Total TCDF	ND		0.3			___
Total PeCDF	EMPC			0.79	J,3	X__
Total HxCDF	3.9	2		8.1	J,3	X__
Total HpCDF	12.7	2		14.3	J,3	X__

MIT3_PSR v1.00, LARS 6.25.05

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URS Group, Inc.

TLI Project: 58885
Client Sample: ~~40555~~ 40555
ltr 2/26/03

Toxicity Equivalents Report
Analysis File: **S025902**

Client Project:	09604-258/RFAAPSWMU#40/71				
Sample Matrix:	SOIL	Date Received:	11/12/02	Spike File:	SPMIT32S
TLI ID:	340-77-2	Date Extracted:	11/14/02	ICal:	SF56072
		Date Analyzed:	11/19/02	ConCal:	S025892
Sample Size:	13.100 g	Dilution Factor:	1	% Moisture:	23.1
Dry Weight:	10.074 g	Blank File:	S025881	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	76.9

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.3}	x	1.	=	0.3
1,2,3,7,8-PeCDD	{0.4}	x	0.5	=	0.2
1,2,3,4,7,8-HxCDD	{0.5}	x	0.1	=	0.05
1,2,3,6,7,8-HxCDD	{0.6}	x	0.1	=	0.06
1,2,3,7,8,9-HxCDD	{0.5}	x	0.1	=	0.05
1,2,3,4,6,7,8-HpCDD	26.6	x	0.01	=	0.266
1,2,3,4,6,7,8,9-OCDD	248	x	0.001	=	0.248
TOTAL PCDD					1.2
2,3,7,8-TCDF	{0.3}	x	0.1	=	0.03
1,2,3,7,8-PeCDF	[0.79]	x	0.05	=	0.040
2,3,4,7,8-PeCDF	{0.3}	x	0.5	=	0.2
1,2,3,4,7,8-HxCDF	{0.3}	x	0.1	=	0.03
1,2,3,6,7,8-HxCDF	{0.3}	x	0.1	=	0.03
2,3,4,6,7,8-HxCDF	{0.4}	x	0.1	=	0.04
1,2,3,7,8,9-HxCDF	{0.4}	x	0.1	=	0.04
1,2,3,4,6,7,8-HpCDF	4.0	x	0.01	=	0.040
1,2,3,4,7,8,9-HpCDF	{0.6}	x	0.01	=	0.006
1,2,3,4,6,7,8,9-OCDF	13.6	x	0.001	=	0.0136
TOTAL PCDF					0.5

Total EPA TEFs, 1989a: 1.6 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

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TLI Project: 58885
Client Sample: ~~715B11~~ 715B11
TB 2/26/03

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: S025903

Client Project:	09604-258/RFAAPSWMU#40/71				
Sample Matrix:	SOIL	Date Received:	11/12/2002	Spike File:	SPMIT32S
TLI ID:	340-77-3	Date Extracted:	11/14/2002	ICal:	SF56072
		Date Analyzed:	11/19/2002	ConCal:	S025892
Sample Size:	11.100 g	Dilution Factor:	n/a	% Moisture:	9.5
Dry Weight:	10.046 g	Blank File:	S025881	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	90.5

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.3				
1,2,3,7,8-PeCDD	1.1			1.76	31:06	J
1,2,3,4,7,8-HxCDD	1.2			1.20	34:12	J
1,2,3,6,7,8-HxCDD	2.3			1.09	34:16	J
1,2,3,7,8,9-HxCDD	3.6			1.12	34:36	J
1,2,3,4,6,7,8-HpCDD	53.6			0.95	37:33	
1,2,3,4,6,7,8,9-OCDD	438			0.82	41:13	
2,3,7,8-TCDF	2.1		See alternate column TB 3/3/03	0.84	26:10	
1,2,3,7,8-PeCDF	EMPC		1.7 J,w			XJ
2,3,4,7,8-PeCDF	0.64			1.38	30:45	J
1,2,3,4,7,8-HxCDF	1.3			1.25	33:30	J
1,2,3,6,7,8-HxCDF	ND	0.3				
2,3,4,6,7,8-HxCDF	0.60			1.41	34:06	J
1,2,3,7,8,9-HxCDF	ND	0.4				
1,2,3,4,6,7,8-HpCDF	5.4			0.95	36:31	
1,2,3,4,7,8,9-HpCDF	ND	0.6				
1,2,3,4,6,7,8,9-OCDF	9.8			0.85	41:25	J

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	1.8	2				
Total PeCDD	6.0	4		9.6		
Total HxCDD	28.3	6		29.7		
Total HpCDD	113	2				
Total TCDF	3.2	2		8.1		
Total PeCDF	5.9	4		12.1	J,w	X
Total HxCDF	8.2	5		13.1	J,w	X
Total HpCDF	5.4	1		15.2	J,w	X

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URS Group, Inc.

TLI Project: 58885 Method 8290 TCDD/TCDF Analysis (DB-225)

Client Sample: ~~715B11~~ 715811 Analysis File: **P024286**

~~715B11~~ 2/26/03

Client Project:	09604-258/RFAAPSWMU#40/71				
Sample Matrix:	SOIL	Date Received:	11/12/2002	Spike File:	SPC2NF2S
TLI ID:	340-77-3	Date Extracted:	11/14/2002	ICal:	PF56152
		Date Analyzed:	11/19/2002	ConCal:	P024280
Sample Size:	11.100 g	Dilution Factor:	n/a	% Moisture:	9.5
Dry Weight:	10.046 g	Blank File:	S025881	% Lipid:	n/a
GC Column:	DB-225	Analyst:	JSY	% Solids:	90.5

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	0.69			0.81	23:07	J__

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	148	74.3	40%-130%	0.76	23:06	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.82	21:55	___

Data Reviewer: _____ 11/20/2002

C2NF_PSR v2.03, LARS 6.25.05

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URS Group, Inc.

TLI Project: **58885**
Client Sample: ~~715B11~~ 71 SB11
As 2/26/03

Toxicity Equivalents Report
Analysis File: **S025903**

Client Project:	09604-258/RFAAPSWMU#40/71				
Sample Matrix:	SOIL	Date Received:	11/12/02	Spike File:	SPMIT32S
TLI ID:	340-77-3	Date Extracted:	11/14/02	ICal:	SF56072
		Date Analyzed:	11/19/02	ConCal:	S025892
Sample Size:	11.100 g	Dilution Factor:	1	% Moisture:	9.5
Dry Weight:	10.046 g	Blank File:	S025881	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	90.5

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.3}	x	1.	=	0.3
1,2,3,7,8-PeCDD	1.1	x	0.5	=	0.55
1,2,3,4,7,8-HxCDD	1.2	x	0.1	=	0.12
1,2,3,6,7,8-HxCDD	2.3	x	0.1	=	0.23
1,2,3,7,8,9-HxCDD	3.6	x	0.1	=	0.36
1,2,3,4,6,7,8-HpCDD	53.6	x	0.01	=	0.536
1,2,3,4,6,7,8,9-OCDD	438	x	0.001	=	0.438
TOTAL PCDD					2.5
2,3,7,8-TCDF	0.69	x	0.1	=	0.069
1,2,3,7,8-PeCDF	[1.7]	x	0.05	=	0.085
2,3,4,7,8-PeCDF	0.64	x	0.5	=	0.32
1,2,3,4,7,8-HxCDF	1.3	x	0.1	=	0.13
1,2,3,6,7,8-HxCDF	{0.3}	x	0.1	=	0.03
2,3,4,6,7,8-HxCDF	0.60	x	0.1	=	0.060
1,2,3,7,8,9-HxCDF	{0.4}	x	0.1	=	0.04
1,2,3,4,6,7,8-HpCDF	5.4	x	0.01	=	0.054
1,2,3,4,7,8,9-HpCDF	{0.6}	x	0.01	=	0.006
1,2,3,4,6,7,8,9-OCDF	9.8	x	0.001	=	0.0098
TOTAL PCDF					0.80

Total EPA TEFs, 1989a: 3.3 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

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DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: AS
Date: 1/24/2003
DV Level: II III IV
Review Document:
__X__ SW-846 __X__ Project QAPP/SAP __X__ NFG EPA 540-R-02-003 (August 2002)

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Triangle
SDG No.: 58885
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		✓
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes: 40/SSY 340-77-1
Labas "SS" 40/SSS 340-77-2
changed to "SS" 71 SB11 340-77-3

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes: 2°C Stored at 4°C extracted on 11/14/02 and analyzed on 11/19/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? Action: If yes, an action level of 5 times the blank value is used to qualify sample results "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.			✓

Notes:

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥2.5:1 ; CCC ≥10:1) If no, apply "R" to estimated detection limits.	✓		
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	✓		
4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51
7	M+2/M+4	1.04	0.88- 1.2
8	M+2	0.89	0.76- 1.02

Notes: ICAL SF56072 % RSDs <12 ICAL PF56152
DB5 6 points ✓ met isotopic ratios DB-225 6 points ✓ met ratios

6/7/02 6/15/02

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If not, apply	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824 compared to m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed defining descriptor switching times of scan ranges? If not, flag total homologue results "J+/UJ-".	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≥ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits of ±20% for targets and ±30% for reference compounds?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes: %Rec RPD
LCS/D 90-110 and ≤10% for soil

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ.	✓		
8.2	Are standard recoveries for all samples within ~~40-135%~~ for all samples? If no, apply J/UJ.	✓		

Notes: BLK ✓ 40554 ✓ 40555 ✓ 71 SB11 ✓
✓ ✓ ✓ ✓

9.0 Field Duplicate		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			✓
9.2	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Were all sample results within the calibrated range, if not apply J.	✓		
10.2	Is the signal to noise ion ratios ≥ 2.5:1 for positive results? If not, flag "J".			
10.3	Is the ion abundance ratio within 10% of the ratio in the most current CCC for positive results? If no, this result should be reported as an EMPC.			
10.4	Are the two identification peak apexs within 2 seconds for positive identifications? If not, flag "R".		✓	
10.5	Was a second column confirmation used for positive 2,3,7,8-TCDF? If no, apply "R" to the 2,3,7,8-TCDF results. 71 SB 11 2.1 / 0.69	✓		
10.6	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?			

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is the percent completeness within the control limits? (Control limit 90%)			
11.1.1	Number of samples:			
11.1.2	Number of target compounds in each analysis:			
11.1.3	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness =			

Notes:

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Percent Moisture/Solid Calculations
Project: 58885

Sample #	crd	R	Empty Vial.Wt	Wet Vial Weight...	Dry Vial Weight...	Entered.By.....	Date....	Time....	%Moist	%Solid	Valid Weight From.....-To.....	Target Weight...
002		Y	35.6000	0.0000	0.0000	Taylor	11/13/02	11:01:01	35.6	64.4	14.9068-16.1491	15.5280
003		Y	23.1200	0.0000	0.0000	Taylor	11/13/02	11:01:01	23.1	76.9	12.4837-13.5241	13.0039
004		Y	9.5200	0.0000	0.0000	Taylor	11/13/02	11:01:01	9.5	90.5	10.6077-11.4917	11.0497

Percent Moisture/Solid Summary

TLI.MILES.ID....	TLI.Number..	Client.Id.Number.....		%Moist	%Solid	ExtrctWt	DryWtEqu	RPD..
58885- -002	340-77-1	40554	40554	35.6	64.4	15.600	10.046	
58885- -003	340-77-2	40555	40555	23.1	76.9	13.100	10.074	
58885- -004	340-77-3	715811	715811	9.5	90.5	11.100	10.046	

*** End of Report ***

Method: 8290
Matrix: ash
Ext. Date: 11-14-02
Analyst: S. White

Project-Sample ID / TLI ID			Gross Weight Before (g)	Gross Weight After (g)	Sample Size g / mL	SRW 83261 USF-ALS 9/13/03 11/14/02 18:35 0.1 ug/mL 20 uL	SRW 8328M USF-MX 4/29/03 11/14/02 18:35 0.01 ug/mL 40 uL	LP 8333B USF-C 9/26/03 11/15/02 9:08 0.01 ug/mL 20 uL	____ ____ ____ / / / / : ____ ug/mL ____ uL	Chemist Spike # Spike ID " Exp. " Date " Time Concen. Volume
58884	1	TLI Blank	/	/	10.0	SRW		LP		Any Left ~~Yes / No~~
58884	2	340-76-1	281.9	270.2	11.6					Yes / No
58884	3	340-76-2	273.2	261.6	11.5					Yes / No
58884	4	340-76-3	271.5	257.9	13.6					Yes / No
58884	5	TLI LCS	/	/	10.0		SRW			~~Yes / No~~
58884	6	TLI LCSD	/	/	10.0		SRW			~~Yes / No~~
58885	2	340-77-1	499.1	453.4	15.6					Yes / No
58885	3	340-77-2	441.6	427.8	13.1					Yes / No
58885	4	340-77-3	556.4	545.2	11.1					Yes / No
58893	2	340-85-1A	163.9	147.5	16.3	↓		↓		Yes / No
58901	2	340-93-1	232.2	218.0	10.1	SRW		LP		Yes / No
										Yes / No
										Yes / No
										Yes / No

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 58950_(Revision 1) **Fraction:** Dioxin/Furan

Lab: Triangle **Project Name:** Radford SWMU 40/71_

Reviewer: Andrea_Sansom **Date:** April 17, 2003

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The laboratory control spike pair displayed recoveries greater than the upper control limit (i.e., 130%) for 2,3,4,7,8-PeCDF at 134% and 136%. Both associated field sample results were positive and were flagged "J,l".

The method blank displayed an estimate positive detection for 1,2,3,7,8-PeCDF at 0.18 pg/g. This method blank also displayed estimated maximum possible contamination for 2,3,7,8-TCDD at 0.12 pg/g, OCDD at 0.55 pg/g, and OCDF at 0.54 pg/g. Associated positive field sample results less than five times the blank concentration were flagged "B,z".

The laboratory flag "X" indicates that the associated PCDF peak/s has the same retention time as the associated diphenyl ether and that the diphenyl ether contribution to the total PCDF value is greater than ten percent. All PCDF results that were influenced by this co-elution have been reported as estimate maximum possible concentrations and were flagged "J,w".

Correctable Anomalies: None.

Comments: Positive detections for 2,3,7,8-TCDF on the DB-5 column were re-analyzed on a DB-225 column that is more suitable for determination of this congener. The DB-225 results for this congener should be used for data interpretation. This concentration has been appropriately used to determine the toxicity equivalent factor.

The laboratory flag "J" represents a reported concentration that was less than the linear range of the initial calibration and an estimate sample result.

Signed: Andrea Sansom

URS Group, Inc.

TLI Project: **58950** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **71SS13** — Analysis File: **T025978**

Client Project:	09604-258/RFAAP			ICal:	TF56122
Sample Matrix:	SOIL	Date Received:	11/19/2002	Spike File:	SPMIT32S
TLI ID:	341-43-1	Date Extracted:	11/20/2002	1st CCal:	T025973
		Date Analyzed:	11/23/2002	End CCal:	T025987
Sample Size:	11.800 g	Dilution Factor:	n/a	% Moisture:	14.7
Dry Weight:	10.065 g	Blank File:	S026010	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JSY	% Solids:	85.3

Analytes		Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	B,Z	0.37			0.82	27:39	JB_
1,2,3,7,8-PeCDD		0.74			1.56	31:48	J__
1,2,3,4,7,8-HxCDD		1.5			1.20	34:55	J__
1,2,3,6,7,8-HxCDD		3.0			1.32	35:00	J__
1,2,3,7,8,9-HxCDD		3.4			1.21	35:19	J__
1,2,3,4,6,7,8-HpCDD		89.9			1.02	38:25	___
1,2,3,4,6,7,8,9-OCDD		1050			0.85	42:17	___
2,3,7,8-TCDF		EMPC		1.9 see alternate column % solids			___
1,2,3,7,8-PeCDF		ND	0.1				___
2,3,4,7,8-PeCDF	J,I	0.76			1.77	31:29	J__
1,2,3,4,7,8-HxCDF		2.3			1.21	34:11	J__
1,2,3,6,7,8-HxCDF		0.96			1.20	34:19	J__
2,3,4,6,7,8-HxCDF		0.99			1.40	34:47	J__
1,2,3,7,8,9-HxCDF		ND	0.2				___
1,2,3,4,6,7,8-HpCDF		10.3			0.98	37:19	___
1,2,3,4,7,8,9-HpCDF		ND	0.4				___
1,2,3,4,6,7,8,9-OCDF		35.5			0.81	42:30	___

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	3.6	4		6.7		___
Total PeCDD	3.5	4		5.4		___
Total HxCDD	24.6	5		32.3		___
Total HpCDD	180	2				___
Total TCDF	10.3	9		19.1	J,3	X__
Total PeCDF	18.6	12		24.1	J,3	X__
Total HxCDF	12.7	6		33.5	J,3	X__
Total HpCDF	32.9	2		38.9	J,3	X__

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TLI Project: **58950** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **71SS13** Analysis File: **P024339**

Client Project:	09604-258/RFAAP				
Sample Matrix:	SOIL	Date Received:	11/19/2002	Spike File:	SPC2NF2S
TLI ID:	341-43-1	Date Extracted:	11/20/2002	ICal:	PF56152
		Date Analyzed:	11/25/2002	ConCal:	P024335
Sample Size:	11.800 g	Dilution Factor:	n/a	% Moisture:	14.7
Dry Weight:	10.065 g	Blank File:	S026010	% Lipid:	n/a
GC Column:	DB-225	Analyst:	LAG	% Solids:	85.3

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	0.66			0.67	23:02	J

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	148	74.5	40%-130%	0.77	23:02	

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.81	21:52	

Data Reviewer: GBM 11/26/2002

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TLI Project: **58950**
Client Sample: **71SS13**

Toxicity Equivalents Report
Analysis File: **T025978**

Client Project:	09604-258/RFAAP			ICal:	TF56122
Sample Matrix:	SOIL	Date Received:	11/19/02	Spike File:	SPMIT32S
TLI ID:	341-43-1	Date Extracted:	11/20/02	1st CCal:	T025973
		Date Analyzed:	11/23/02	End CCal:	T025987
Sample Size:	11.800 g	Dilution Factor:	1	% Moisture:	14.7
Dry Weight:	10.065 g	Blank File:	S026010	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JSY	% Solids:	85.3

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	0.37	x	1.	=	0.37
1,2,3,7,8-PeCDD	0.74	x	0.5	=	0.37
1,2,3,4,7,8-HxCDD	1.5	x	0.1	=	0.15
1,2,3,6,7,8-HxCDD	3.0	x	0.1	=	0.30
1,2,3,7,8,9-HxCDD	3.4	x	0.1	=	0.34
1,2,3,4,6,7,8-HpCDD	89.9	x	0.01	=	0.899
1,2,3,4,6,7,8,9-OCDD	1050	x	0.001	=	1.050
TOTAL PCDD					3.48
2,3,7,8-TCDF	0.66	x	0.1	=	0.066
1,2,3,7,8-PeCDF	{0.1}	x	0.05	=	0.005
2,3,4,7,8-PeCDF	0.76	x	0.5	=	0.38
1,2,3,4,7,8-HxCDF	2.3	x	0.1	=	0.23
1,2,3,6,7,8-HxCDF	0.96	x	0.1	=	0.096
2,3,4,6,7,8-HxCDF	0.99	x	0.1	=	0.099
1,2,3,7,8,9-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,4,6,7,8-HpCDF	10.3	x	0.01	=	0.103
1,2,3,4,7,8,9-HpCDF	{0.4}	x	0.01	=	0.004
1,2,3,4,6,7,8,9-OCDF	35.5	x	0.001	=	0.0355
TOTAL PCDF					1.04

Total EPA TEFs, 1989a: 4.52 pg/g

{...} indicates that the value is that of a Detection Limit.

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TLI Project: **58950** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **71SB11B** — Analysis File: **T025979**

Client Project:	09604-258/RFAAP			ICal:	TF56122
Sample Matrix:	SOIL	Date Received:	11/19/2002	Spike File:	SPMIT32S
TLI ID:	341-43-2	Date Extracted:	11/20/2002	1st CCal:	T025973
		Date Analyzed:	11/23/2002	End CCal:	T025987
Sample Size:	10.300 g	Dilution Factor:	n/a	% Moisture:	2.4
Dry Weight:	10.053 g	Blank File:	S026010	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JSY	% Solids:	97.6

Analytes		Conc. (pg/g)	DL	EMPC		Ratio	RT	Flags
2,3,7,8-TCDD	B,z	0.54				0.85	27:45	JB_
1,2,3,7,8-PeCDD		ND	0.6					___
1,2,3,4,7,8-HxCDD		ND	1.3					___
1,2,3,6,7,8-HxCDD		10.1				1.32	35:02	___
1,2,3,7,8,9-HxCDD		5.5				1.31	35:21	___
1,2,3,4,6,7,8-HpCDD		226				1.02	38:26	___
1,2,3,4,6,7,8,9-OCDD		2470				0.83	42:18	___
~~2,3,7,8-TCDF~~		~~EMPC~~		~~2.9~~	see alternate column Az 3/3/03			___
1,2,3,7,8-PeCDF		ND	0.4					___
2,3,4,7,8-PeCDF	J,I	1.2				1.52	31:31	J__
1,2,3,4,7,8-HxCDF		4.3				1.26	34:14	J__
1,2,3,6,7,8-HxCDF		2.1				1.26	34:21	J__
2,3,4,6,7,8-HxCDF		EMPC		1.7				J__
1,2,3,7,8,9-HxCDF		ND	1.0					___
1,2,3,4,6,7,8-HpCDF		34.3				0.95	37:21	___
1,2,3,4,7,8,9-HpCDF		ND	2.0					___
1,2,3,4,6,7,8,9-OCDF		87.6				0.86	42:32	___

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	5.7	4		7.2		___
Total PeCDD	ND		0.6			___
Total HxCDD	60.2	4		73.5		___
Total HpCDD	442	2				___
Total TCDF	11.0	5		26.8	J,w	X__
Total PeCDF	13.9	5		26.6	J,w	X__
Total HxCDF	49.9	6		72.5	J,w	X__
Total HpCDF	109	2		120		___

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TLI Project: **58950** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **71SB11B** Analysis File: **P024340**

Client Project:	09604-258/RFAAP				
Sample Matrix:	SOIL	Date Received:	11/19/2002	Spike File:	SPC2NF2S
TLI ID:	341-43-2	Date Extracted:	11/20/2002	ICal:	PF56152
		Date Analyzed:	11/25/2002	ConCal:	P024335
Sample Size:	10.300 g	Dilution Factor:	n/a	% Moisture:	2.4
Dry Weight:	10.053 g	Blank File:	S026010	% Lipid:	n/a
GC Column:	DB-225	Analyst:	LAG	% Solids:	97.6

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	EMPC		1.0			___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	156	78.6	40%-130%	0.77	23:11	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.80	22:01	___

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TLI Project: **58950**
Client Sample: **71SB11B**

Toxicity Equivalents Report
Analysis File: **T025979**

Client Project:	09604-258/RFAAP			ICal:	TF56122
Sample Matrix:	SOIL	Date Received:	11/19/02	Spike File:	SPMIT32S
TLI ID:	341-43-2	Date Extracted:	11/20/02	1st CCal:	T025973
		Date Analyzed:	11/23/02	End CCal:	T025987
Sample Size:	10.300 g	Dilution Factor:	1	% Moisture:	2.4
Dry Weight:	10.053 g	Blank File:	S026010	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JSY	% Solids:	97.6

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	0.54	x	1.	=	0.54
1,2,3,7,8-PeCDD	{0.6}	x	0.5	=	0.3
1,2,3,4,7,8-HxCDD	{1.3}	x	0.1	=	0.13
1,2,3,6,7,8-HxCDD	10.1	x	0.1	=	1.01
1,2,3,7,8,9-HxCDD	5.5	x	0.1	=	0.55
1,2,3,4,6,7,8-HpCDD	226	x	0.01	=	2.26
1,2,3,4,6,7,8,9-OCDD	2470	x	0.001	=	2.470
TOTAL PCDD					7.3
2,3,7,8-TCDF	[1.0]	x	0.1	=	0.10
1,2,3,7,8-PeCDF	{0.4}	x	0.05	=	0.02
2,3,4,7,8-PeCDF	1.2	x	0.5	=	0.60
1,2,3,4,7,8-HxCDF	4.3	x	0.1	=	0.43
1,2,3,6,7,8-HxCDF	2.1	x	0.1	=	0.21
2,3,4,6,7,8-HxCDF	[1.7]	x	0.1	=	0.17
1,2,3,7,8,9-HxCDF	{1.0}	x	0.1	=	0.10
1,2,3,4,6,7,8-HpCDF	34.3	x	0.01	=	0.343
1,2,3,4,7,8,9-HpCDF	{2.0}	x	0.01	=	0.020
1,2,3,4,6,7,8,9-OCDF	87.6	x	0.001	=	0.0876
TOTAL PCDF					2.08

Total EPA TEFs, 1989a: 9.3 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

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DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: AS
Date: 1/24/2003
DV Level: II III IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002)

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Triangle
SDG No.: 58950
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes: 71SS13 341-43-1 85.3% solid
71SB11B 341-43-2 97.6% solid

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes: Cooler at 4°C, stored at 4°C extracted 11/20/02
collected 11/18/02 analyzed 11/23/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? Action: If yes, an action level of 5 times the blank value is used to qualify sample results "B".	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.			✓

Notes: 2378 TCDD 0.12 EMPC J
OCDD 0.55 EMPC J
12378 PeCDF 0.18 J
OCDF 0.54 EMPC J

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥2.5:1 ; CCC ≥10:1) If no, apply "R" to estimated detection limits.	✓		
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	✓		
4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51
7	M+2/M+4	1.04	0.88- 1.2
8	M+2	0.89	0.76- 1.02

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed defining descriptor switching times of scan ranges? If not, flag total homologue results "J+/UJ-".	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≥ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits of ±20% for targets and ±30% for reference compounds?	✓		
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes: 23478- PeCDF 134/136%
2378 TCDD 120/122% OKAY

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	✓		
8.2	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	✓		

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			✓
9.2	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Were all sample results within the calibrated range, if not apply J. Lab flagged J, not standard for Region III			✓
10.2	Is the signal to noise ion ratios ≥ 2.5:1 for positive results? If not, flag "J".	✓		
10.3	Is the ion abundance ratio within 10% of the ratio in the most current CCC for positive results? If no, this result should be reported as an EMPC.	✓		
10.4	Are the two identification peak apexs within 2 seconds for positive identifications? If not, flag "R".	✓		
10.5	Was a second column confirmation used for positive 2,3,7,8-TCDF? If no, apply "R" to the 2,3,7,8-TCDF results.	✓		
10.6	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
11.1.1	Number of samples:			
11.1.2	Number of target compounds in each analysis:			
11.1.3	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = 100%			

Notes:

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1024

Project Number	Project Name
07E4-A5	LRFAAP

Project Contact (Name and Phone Number): Darren Reams

Samplers: Field Sampler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
715513	11/18/02 1000	S		X	9	C		1							X								
715B118	11/18/02 1200	S		X	9	C		1							X								

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other Soil

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	1400	[signature]			
Relinquished by:	Date/time	Received by: (for lab)	Date/Time: 11/19/02 1036	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

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TRIANGLE LABORATORIES, INC. -- LOG IN RECORD/CHAIN OF CUSTODY

Custody Seal : Present/Intact
Chain of Custody : Present
Sample Tags : Absent
Sample Tag Numbers: Not Listed on Chain of Custody
SMO Forms : N/A

Sample Seals: Absent
Container...: Intact

TLI Project Number 58950
Client: URS20 - URS Group, Inc.

Book 341

Date Received 11/19/02 By

Page 43

Ice Chest ICE Temp 4.0 C

Carrier and Number FED EX

TLI Number.. mR/H:CPM.	Client Sample ID..... Client COC ID.....*	Matrix Location.....	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	DISPOSED Date/Init
341-43-1	71SS13	SOIL									
	71SS13	CO2	11/20/02	11/20/02							
341-43-2	71SB11B	SOIL									
	71SB11B	CO2	11/20/02	11/20/02							

Receiving Remarks:

Archive Remarks:

15

Sample #	crd	R	Empty Vial.Wt	Wet Vial Weight...	Dry Vial Weight...	Entered.By.....	Date....	Time....	%Moist	%Solid	Valid Weight From.....-To.....	Target Weight...
002		Y	14.7200	0.0000	0.0000	Taylor	11/20/02	09:58:54	14.7	85.3	11.2544-12.1923	11.7233
003		Y	2.4000	0.0000	0.0000	Taylor	11/20/02	09:58:54	2.4	97.6	9.8361-10.6557	10.2459

Percent Moisture/Solid Summary

TLI.MILES.ID....	TLI.Number..	Client.Id.Number.....	%Moist	%Solid	ExtrctWt	DryWtEqu	RPD..
58950- -002	341-43-1	71SS13	14.7	85.3	11.800	10.065	
58950- -003	341-43-2	71SB11B	2.4	97.6	10.300	10.053	

*** End of Report ***

Method: 8290
Matrix: Soil
Ext. Date: 11/20/02
Analyst: E

Project-Sample ID / TLI ID			Gross Weight Before	Gross Weight After	Sample Size (g) / mL	E 8326M USF-A15 09/13/03 11/20/02 14:00 0.1 ug/mL 20 uL	E 8259M USF-MX 04/29/03 11/20/02 14:00 0.01 ug/mL 40 uL	AA 5333H USF-C 09/26/03 11/21/02 16:23 0.01 ug/mL 20 uL	_____ _____ _____ / / / / : ____ ug/mL ____ uL	Chemist Spike # Spike ID " Exp. " Date " Time Concen. Volume	Any Left Yes / No
58947	1	TLI Blank	/	/	10.0g	E		AA			Yes / No
58947	2	341-40-1	316.6g	301.6g	14.7g						Yes / No
58947	3	341-40-2A	337.9g	—	12.3g						Yes / No
58947	4	341-40-2AMS	—	—	12.3g		E				Yes / No
58947	5	41-40-2AMSD	—	299.5g	12.3g		E				Yes / No
58947	6	341-40-3	315.8g	303.4g	12.2g						Yes / No
58947	10	341-40-7	340.1g	325.8g	13.6g						Yes / No
58947	11	341-40-8	351.3g	336.8g	13.9g						Yes / No
58947	12	341-40-9	353.6g	339.9g	13.3g						Yes / No
58947	13	341-40-10	337.0g	324.2g	12.6g						Yes / No
58947	15	TLI LCS	/	/	10.0g		E				Yes / No
58947	16	TLI LCSD	/	/	10.0g		E				Yes / No
58950	2	341-43-1	552.3g	540.1g	11.8g	↓		↓			Yes / No
58950	3	341-43-2	357.5g	347.0g	10.3g	E		AA			Yes / No

Method: 8290
Matrix: Soil
Ext. Date: 11/20/02
Analyst: E

Project-Sample ID / TLI ID			Gross Weight Before	Gross Weight After	Sample Size (g) / mL					Chemist
						E		EA		Chemist
						8326M		8333H		Spike #
						USF-AIS		USF-C		Spike ID
						09/13/03	/ /	09/26/03	/ /	" Exp.
						11/20/02	/ /	11/21/02	/ /	" Date
						14:00	:	16:25	:	" Time
						0.1 ug/mL	ug/mL	0.1 ug/mL	ug/mL	Concen.
						20 uL	uL	20 uL	uL	Volume
58876 r1	3	340-68-3	441.4g	428.3g	13.1g	E		AA		(Yes) / No
										Yes / No
										Yes / No
										Yes / No
										Yes / No
										Yes / No
										Yes / No
										Yes / No
										Yes / No
										Yes / No
										Yes / No
										Yes / No
										Yes / No
										Yes / No

TRIANGLE LABORATORIES, INC.
LAB CONTROL SPIKE RECOVERY ANALYSIS AND COMPARISON

Project: 58950
Matrix: SAND
Method: 8290

Isomer	S026010 ID: TLI Blank Sample (pg/g)	S026020 ID: TLI LCS With Spike (pg/g)	Percent Recovery	S026021 ID: TLI LCSD Spike Dup (pg/g)	Percent Recovery	Relative Percent Difference
2378-TCDD	[0.12]	48.0	120	48.8	122 OK	1.65
12378-PeCDD	ND	229	115	232	116	0.87
123478-HxCDD	ND	197	98.3	195	97.7	0.61
123678-HxCDD	ND	204	102	213	107	4.78
123789-HxCDD	ND	213	107	199	99.3	7.46
1234678-HpCDD	ND	209	105	209	104	0.96
OCDD	[0.55]	394	98.4	401	100	1.61
2378-TCDF	ND	50.0	125 OK	50.3	126 OK	0.80
12378-PeCDF	0.18	241	120	240	120	0.0
23478-PeCDF	ND	268	134	271	136	1.48
123478-HxCDF	ND	202	101	205	102	0.99
123678-HxCDF	ND	213	106	218	109	2.79
234678-HxCDF	ND	226	113	235	117	3.48
123789-HxCDF	ND	191	95.5	201	100	4.60
1234678-HpCDF	ND	217	109	235	117	7.08
1234789-HpCDF	ND	201	100	224	112	11.3
OCDF	[0.54]	399	99.6	404	101	1.40

ND: Not Detected
NA: Not Applicable
[..]: EMPC Value

MILES 4.22.16
GRY_PSUM v1.11

Processed By: GEM Date: 11/26/02

Percent Recovery QC Limits: 70 to 130 percent. OKAY
Relative Percent Difference QC Limits: +/- 20 percent.

Nominal Spike Levels:
- TCDD/TCDF..: 0.4 ng
- PeCDD/PeCDF: 2.0 ng
- HxCDD/HxCDF: 2.0 ng
- HpCDD/HpCDF: 2.0 ng
- OCDD/OCDF..: 4.0 ng

Data File	S026010		T025978		T025979		S026020
Sample ID	TLI Blank		71SS13		71SB11B		TLI LCS
Units	pg/g		pg/g		pg/g		pg/g
Extraction Date	11/20/2002		11/20/2002		11/20/2002		11/20/2002
Analysis Date	11/23/2002		11/23/2002		11/23/2002		11/23/2002
Instrument	S		T		T		S
Matrix	SAND		SOIL		SOIL		SAND
Extraction Type							
Analytes							
2378-TCDD	{0.12} J	0.60	0.37	JB B	0.54	JB B	48.0
12378-PeCDD	(0.08)		0.74	J	(0.6)		229
123478-HxCDD	(0.1)		1.5	J	(1.3)		197
123678-HxCDD	(0.1)		3.0	J	10.1		204
123789-HxCDD	(0.10)		3.4	J	5.5		213
1234678-HpCDD	(0.2)		89.9		226		209
OCDD	{0.55} J	1.75	1050		2470		394
2378-TCDF	(0.07)		{1.9}		{2.9}		50.0
12378-PeCDF	0.18 J	0.9	(0.1)	B	(0.4)	B	241
23478-PeCDF	(0.07)		0.76	J	1.2	J	268
123478-HxCDF	(0.06)		2.3	J	4.3	J	202
123678-HxCDF	(0.06)		0.96	J	2.1	J	213
234678-HxCDF	(0.07)		0.99	J	{1.7}	J	226
123789-HxCDF	(0.07)		(0.2)		(1.0)		191
1234678-HpCDF	(0.09)		10.3		34.3		217
1234789-HpCDF	(0.1)		(0.4)		(2.0)		201
OCDF	{0.54} J	2.7	35.5		87.6		399
TOTAL TCDD	{0.12}		3.6		5.7		
TOTAL PeCDD	(0.08)		3.5		(0.6)		
TOTAL HxCDD	{0.25}		24.6		60.2		
TOTAL HpCDD	(0.2)		180		442		
TOTAL TCDF	(0.07)		10.3	X	11.0	X	
TOTAL PeCDF	0.18		18.6	X	13.9	X	
TOTAL HxCDF	(0.06)		12.7	X	49.9	X	
TOTAL HpCDF	(0.1)		32.9	X	109		
Other Standards Percent Recovery Summary (% Rec)							
37Cl-TCDD	58.3		82.1		73.9		65.4
Other Standards Percent Recovery Summary (% Rec)							
13C12-PeCDF 234	89.9		77.4		68.3		93.7
13C12-HxCDF 478	88.2		89.0		90.7		79.3
13C12-HxCDD 478	88.7		84.7		88.9		78.4
13C12-HpCDF 789	77.3		65.5		68.0		71.3
Other Standards Percent Recovery Summary (% Rec)							
13C12-HxCDF 789	84.0		76.9		82.0		78.3
13C12-HxCDF 234	109		88.0		88.9		96.7
Internal Standards Percent Recovery Summary (% Rec)							
13C12-2378-TCDF	64.9		77.8		77.9		71.4
13C12-2378-TCDD	68.2		76.3		75.6		72.8

TRIANGLE LABORATORIES, INC.
Sample Results for Project 58950
Method 8290X (DB-225)

Data File	P024339	P024340
Sample ID	71SS13	71SB11B
Units	pg/g	pg/g
Extraction Date	11/20/2002	11/20/2002
Analysis Date	11/25/2002	11/25/2002
Instrument	P	P
Matrix	SOIL	SOIL
Extraction Type		
Analytes		
2378-TCDF	0.66 J	{1.0}
Internal Standards Percent Recovery Summary (% Rec)		
13C12-2378-TCDF	74.5	78.6

{Estimated Maximum Possible Concentration}.

URS Group, Inc.

TLI Project: **58950** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **TLI Blank** — Analysis File: **S026010**

Client Project:	09604-258/RFAAP				
Sample Matrix:	SAND	Date Received:	/ /	Spike File:	SPMIT32S
TLI ID:	TLI Blank	Date Extracted:	11/20/2002	ICal:	SF56072
		Date Analyzed:	11/23/2002	ConCal:	S026008
Sample Size:	10.000 g	Dilution Factor:	n/a	% Moisture:	n/a
Dry Weight:	n/a	Blank File:	S026010	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JWL	% Solids:	n/a

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	EMPC		0.12			J__
1,2,3,7,8-PeCDD	ND	0.08				__
1,2,3,4,7,8-HxCDD	ND	0.1				__
1,2,3,6,7,8-HxCDD	ND	0.1				__
1,2,3,7,8,9-HxCDD	ND	0.10				__
1,2,3,4,6,7,8-HpCDD	ND	0.2				__
1,2,3,4,6,7,8,9-OCDD	EMPC		0.55			J__
2,3,7,8-TCDF	ND	0.07				__
1,2,3,7,8-PeCDF	0.18			1.54	29:44	J__
2,3,4,7,8-PeCDF	ND	0.07				__
1,2,3,4,7,8-HxCDF	ND	0.06				__
1,2,3,6,7,8-HxCDF	ND	0.06				__
2,3,4,6,7,8-HxCDF	ND	0.07				__
1,2,3,7,8,9-HxCDF	ND	0.07				__
1,2,3,4,6,7,8-HpCDF	ND	0.09				__
1,2,3,4,7,8,9-HpCDF	ND	0.1				__
1,2,3,4,6,7,8,9-OCDF	EMPC		0.54			J__

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	EMPC			0.12	__
Total PeCDD	ND		0.08		__
Total HxCDD	EMPC			0.25	__
Total HpCDD	ND		0.2		__
Total TCDF	ND		0.07		__
Total PeCDF	0.18	1			__
Total HxCDF	ND		0.06		__
Total HpCDF	ND		0.1		__

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Printed: 16:43 11/26/2002

TLI Project: **58950** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **TLI Blank** Analysis File: **S026010**

Internal Standards	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	130	64.9	40%-135%	0.75	25:46	___
$^{13}C_{12}$-2,3,7,8-TCDD	136	68.2	40%-135%	0.79	26:29	___
$^{13}C_{12}$-1,2,3,7,8-PeCDF	154	77.0	40%-135%	1.49	29:45	___
$^{13}C_{12}$-1,2,3,7,8-PeCDD	188	94.0	40%-135%	1.47	30:46	___
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	192	96.1	40%-135%	0.50	33:17	___
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	196	98.0	40%-135%	1.21	33:57	___
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	167	83.6	40%-135%	0.43	36:09	___
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	162	80.8	40%-135%	1.02	37:10	___
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	272	67.9	40%-135%	0.85	40:45	___

Surrogate Standards (Type B)	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,4,7,8-PeCDF	180	89.9	40%-135%	1.50	30:26	___
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	176	88.2	40%-135%	0.52	33:12	___
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	177	88.7	40%-135%	1.24	33:53	___
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	155	77.3	40%-135%	0.43	37:40	___

Other Standard	Conc. (pg/g)	% Recovery	QC Limits	RT	Flags
$^{37}Cl_4$-2,3,7,8-TCDD	11.7	58.3	40%-135%	26:30	___

Alternate Standards (Type B)	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	168	84.0	40%-135%	0.50	34:32	___
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	218	109	40%-135%	0.51	33:46	___

Recovery Standards	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.80	26:16	___
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.23	34:17	___

Data Reviewer: GAM 11/26/2002

MIT3_PSR v1.00, LARS 6.25.05

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Printed: 16:43 11/26/2002

URS Group, Inc.

TLI Project: **58950**
Client Sample: **TLI Blank**

Toxicity Equivalents Report
Analysis File: **S026010**

Client Project:	09604-258/RFAAP				
Sample Matrix:	SAND	Date Received:	11/19/02	Spike File:	SPMIT32S
TLI ID:	TLI Blank	Date Extracted:	11/20/02	ICal:	SF56072
		Date Analyzed:	11/23/02	ConCal:	S026008
Sample Size:	10.000 g	Dilution Factor:	1	% Moisture:	n/a
Dry Weight:	n/a	Blank File:	S026010	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JWL	% Solids:	n/a

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.12}	x	1.	=	0.12
1,2,3,7,8-PeCDD	{0.08}	x	0.5	=	0.04
1,2,3,4,7,8-HxCDD	{0.1}	x	0.1	=	0.01
1,2,3,6,7,8-HxCDD	{0.1}	x	0.1	=	0.01
1,2,3,7,8,9-HxCDD	{0.10}	x	0.1	=	0.010
1,2,3,4,6,7,8-HpCDD	{0.2}	x	0.01	=	0.002
1,2,3,4,6,7,8,9-OCDD	[0.55]	x	0.001	=	0.00055
TOTAL PCDD					0.19
2,3,7,8-TCDF	{0.07}	x	0.1	=	0.007
1,2,3,7,8-PeCDF	0.18	x	0.05	=	0.0090
2,3,4,7,8-PeCDF	{0.07}	x	0.5	=	0.04
1,2,3,4,7,8-HxCDF	{0.06}	x	0.1	=	0.006
1,2,3,6,7,8-HxCDF	{0.06}	x	0.1	=	0.006
2,3,4,6,7,8-HxCDF	{0.07}	x	0.1	=	0.007
1,2,3,7,8,9-HxCDF	{0.07}	x	0.1	=	0.007
1,2,3,4,6,7,8-HpCDF	{0.09}	x	0.01	=	0.0009
1,2,3,4,7,8,9-HpCDF	{0.1}	x	0.01	=	0.001
1,2,3,4,6,7,8,9-OCDF	[0.54]	x	0.001	=	0.00054
TOTAL PCDF					0.08

Total EPA TEFs, 1989a: 0.28 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

GRY_TEF v1.08, MILES 4.22.16

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Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 58987_(Revision 1) **Fraction:** Dioxin/Furan

Lab: Triangle **Project Name:** Radford SWMU 40/71_

Reviewer: Andrea_Sansom **Date:** April 17, 2003

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The method blank displayed estimate positive detections for 1,2,3,4,7,8-HxCDF at 0.15 pg/g and OCDF at 0.49 pg/g. This method blank also displayed estimated maximum possible contamination for OCDD at 0.34 pg/g, and 1,2,3,7,8-PeCDF at 0.10 pg/g. The associated field sample results were either greater than five times the blank concentration or non-detect, thus, no data qualifying action was required.

The laboratory flag "X" indicates that the associated PCDF peak/s has the same retention time as the associated diphenyl ether and that the diphenyl ether contribution to the total PCDF value is greater than ten percent. All PCDF results that were influenced by this co-elution have been reported as estimate maximum possible concentrations and were flagged "J,w".

The laboratory flag "E" denotes a reported concentration that exceeds the upper linear range of the initial calibration. The data validator applied "J,q" to these results.

Correctable Anomalies: None.

Comments: The positive detection for 2,3,7,8-TCDF on the DB-5 column was re-analyzed on a DB-225 column that is more suitable for determination of this congener. The DB-225 result for this congener should be used for data interpretation. This concentration has been appropriately used to determine the toxicity equivalent factor.

The laboratory flag "J" represents a reported concentration that was less than the linear range of the initial calibration and an estimate sample result.

Signed: Andrea Sansom

URS Group, Inc.

TLI Project: **58987** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **TEST PIT 2F** — Analysis File: **U188304**

Client Project:	**Radford Army Ammunition Plant**				
Sample Matrix:	**SOIL**	Date Received:	**11/22/2002**	Spike File:	**SPMIT32S**
TLI ID:	**341-80-1**	Date Extracted:	**11/25/2002**	ICal:	**UF57092**
		Date Analyzed:	**11/27/2002**	ConCal:	**U021882**
Sample Size:	**13.550 g**	Dilution Factor:	**n/a**	% Moisture:	**24.9**
Dry Weight:	**10.176 g**	Blank File:	**U188303**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JSY**	% Solids:	**75.1**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.3				___
1,2,3,7,8-PeCDD	ND	0.5				___
1,2,3,4,7,8-HxCDD	1.3			1.35	34:08	J__
1,2,3,6,7,8-HxCDD	10.6			1.25	34:13	___
1,2,3,7,8,9-HxCDD	3.9			1.30	34:32	J__
1,2,3,4,6,7,8-HpCDD	431			1.02	37:29	___
1,2,3,4,6,7,8,9-OCDD	J/Q 7250			0.91	41:06	E__
~~2,3,7,8-TCDF~~	~~2.5~~		see alternate column #s 3/3/03	~~0.79~~	~~26:04~~	___
1,2,3,7,8-PeCDF	ND	0.3				___
2,3,4,7,8-PeCDF	EMPC		0.38			J__
1,2,3,4,7,8-HxCDF	2.3			1.19	33:27	JB_
1,2,3,6,7,8-HxCDF	1.1			1.09	33:32	J__
2,3,4,6,7,8-HxCDF	EMPC		1.2			J__
1,2,3,7,8,9-HxCDF	ND	0.6				___
1,2,3,4,6,7,8-HpCDF	44.3			1.05	36:27	___
1,2,3,4,7,8,9-HpCDF	2.9			0.97	37:59	J__
1,2,3,4,6,7,8,9-OCDF	124			0.90	41:19	___

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	ND		0.3			___
Total PeCDD	EMPC			2.1		___
Total HxCDD	77.1	8				___
Total HpCDD	907	2				___
Total TCDF	4.4	3		9.8	J, 3 3 3 3	X__
Total PeCDF	EMPC			13.2		X__
Total HxCDF	48.2	5		105		X__
Total HpCDF	174	3		201	J,	X__

MIT3_PSR v1.00, LARS 6.25.05

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URS Group, Inc.

TLI Project: **58987** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **TEST PIT 2F** Analysis File: **P024383**

Client Project:	**Radford Army Ammunition Plant**				
Sample Matrix:	**SOIL**	Date Received:	**11/22/2002**	Spike File:	**SPC2NF2S**
TLI ID:	**341-80-1**	Date Extracted:	**11/25/2002**	ICal:	**PF56152**
		Date Analyzed:	**11/28/2002**	ConCal:	**P024380**
Sample Size:	**13.550 g**	Dilution Factor:	**n/a**	% Moisture:	**24.9**
Dry Weight:	**10.176 g**	Blank File:	**U188303**	% Lipid:	**n/a**
GC Column:	**DB-225**	Analyst:	**JMM**	% Solids:	**75.1**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	EMPC		1.5			—

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	172	87.7	40%-130%	0.72	23:02	—

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.82	21:52	—

Data Reviewer: _____ 11/29/2002

C2NF_PSR v2.03, LARS 6.25.05

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URS Group, Inc.

TLI Project: **58987** — Toxicity Equivalents Report
Client Sample: **TEST PIT 2F** — Analysis File: **U188304**

Client Project:	**Radford Army Ammunition Plant**				
Sample Matrix:	**SOIL**	Date Received:	**11/22/02**	Spike File:	**SPMIT32S**
TLI ID:	**341-80-1**	Date Extracted:	**11/25/02**	ICal:	**UF57092**
		Date Analyzed:	**11/27/02**	ConCal:	**U021882**
Sample Size:	**13.550 g**	Dilution Factor:	**1**	% Moisture:	**24.9**
Dry Weight:	**10.176 g**	Blank File:	**U188303**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JSY**	% Solids:	**75.1**

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.3}	x	1.	=	0.3
1,2,3,7,8-PeCDD	{0.5}	x	0.5	=	0.3
1,2,3,4,7,8-HxCDD	1.3	x	0.1	=	0.13
1,2,3,6,7,8-HxCDD	10.6	x	0.1	=	1.06
1,2,3,7,8,9-HxCDD	3.9	x	0.1	=	0.39
1,2,3,4,6,7,8-HpCDD	431	x	0.01	=	4.31
1,2,3,4,6,7,8,9-OCDD	7250	x	0.001	=	7.250
TOTAL PCDD					13.7
2,3,7,8-TCDF	[1.5]	x	0.1	=	0.15
1,2,3,7,8-PeCDF	{0.3}	x	0.05	=	0.02
2,3,4,7,8-PeCDF	[0.38]	x	0.5	=	0.19
1,2,3,4,7,8-HxCDF	2.3	x	0.1	=	0.23
1,2,3,6,7,8-HxCDF	1.1	x	0.1	=	0.11
2,3,4,6,7,8-HxCDF	[1.2]	x	0.1	=	0.12
1,2,3,7,8,9-HxCDF	{0.6}	x	0.1	=	0.06
1,2,3,4,6,7,8-HpCDF	44.3	x	0.01	=	0.443
1,2,3,4,7,8,9-HpCDF	2.9	x	0.01	=	0.029
1,2,3,4,6,7,8,9-OCDF	124	x	0.001	=	0.124
TOTAL PCDF					1.48

Total EPA TEFs, 1989a: 15.2 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

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DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: AS
Date: 3/1/2003
DV Level: II III IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002)

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: Triangle
SDG No.: 58987
Method No.: 8290

1.0 General: Chain-of-Custody

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes: Test Pit 2F 341-80-1 or 58987-002 24.9/75.1% Moisture Solid

2.0 Preservation/ Holding Times

		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes: Cooler 2°C, samples stored at 4.0°C
Soil sampled 11/21/02 10AM, unpresserved
extracted 11/25/02
analyzed 11/27/02

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? Action: If yes, an action level of 5 times the blank value is used to qualify sample results "B".	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.			✓

Notes:

1,2,3,4,6,7,8,9-OCDD	0.34	EMPC	(J)	Total TCDD	0.15	EMPC	Sample <5x these [J].
1,2,3,7,8-PeCDF	0.10	EMPC	J	total HxCDD	0.62	EMPC	
1,2,3,4,7,8-HxCDF	0.15		J	total PeCDF	0.10	EMPC	
1,2,3,4,6,7,8,9-OCDF	0.49		J	total HxCDF	0.15		

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1) If no, apply "R" to estimated detection limits.	✓		
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51
7	M+2/M+4	1.04	0.88- 1.2
8	M+2	0.89	0.76- 1.02

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓			

Notes: UF57092 7/9/02 PeCDD 2837 3055 PF56152
✓ 6 pts PeCDF 2720 3104 ✓ 6pts 10,000 resolution
✓ < 20% RSD targets TCDD 2326 2706 ✓ < 20, < 30
✓ < 30% Stand RTW standard ✓ TCDF 2203 2707 ✓ ratio 25% valley 1.09
✓ ratios 18% valley 2,3,78/1238 TCDD RF of 2378 TCDF 1.12.
1 pg STD 26000/1700 S/N = 15.3 ✓ 85600/61 ✓

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed defining descriptor switching times of scan ranges? If not, flag total homologue results "J+/UJ-".	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≤ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:
DB225 column isomer specificity check not run - J 2378 TCDF from this column
need to ask for it - actually run #'s P024381 & P024386
30%

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch? Lab Limits	✓		
7.3	Are there any percent recoveries outside the QC limits ~~of ±20% for targets and ±30% for reference compounds~~?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

1,2,3,4,6,7,8 - H_pCDF 125% 123% OKAY

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards

		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	✓		
8.2	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	✓		

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
9.2	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range, if not apply J. Lab has flagged those J.			✓
10.2	Is the signal to noise ion ratios ≥ 2.5:1 for positive results? If not, flag "J".	✓		
10.3	Is the ion abundance ratio within 10% of the ratio in the most current CCC for positive results? If no, this result should be reported as an EMPC.	✓		
10.4	Are the two identification peak apexs within 2 seconds for positive identifications? If not, flag "R".	✓		
10.5	Was a second column confirmation used for positive 2,3,7,8-TCDF? If no, apply "R" to the 2,3,7,8-TCDF results.	✓		
10.6	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		

Notes: Blk · all S/N <2.5:1 were not included.
of 17 targets Ratio out called EMPC.
no 2378 TCDF

11.0 Data Completeness

		Yes	No	NA
11.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
11.1.1	Number of samples:_____			
11.1.2	Number of target compounds in each analysis:			
11.1.3	Number of results rejected and not reported:_____			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = _____ 100%			

Notes:

Radford Army Ammunition Plant
Chain Of Custody Record

No 1026

Project Number	Project Name
CTO# 258	Radford

Project Contact (Name and Phone Number): Darren Price

Samplers: Erica Taylor

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
Test Hole	[illegible]	5		X	1	6		1							X								

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	[illegible]				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	
		[signature]	[illegible]		

1 of 3

TRIANGLE LABORATORIES, INC.
Percent Moisture/Solid Calculations
Project: 58987

Sample #	crd	R	Empty Vial.Wt	Wet Vial Weight...	Dry Vial Weight...	Entered.By.....	Date....	Time....	%Moist	%Solid	Valid Weight From.....-To.....	Target Weight...
002		Y	24.9000	0.0000	0.0000	REED	11/22/02	17:35:42	24.9	75.1	12.7830-13.8482	13.3156

Percent Moisture/Solid Summary

TLI.MILES.ID....	TLI.Number..	Client.Id.Number.....	%Moist	%Solid	ExtrctWt	DryWtEqu	RPD..
58987-	-002	341-80-1 TEST PIT 2F	24.9	75.1			

*** End of Report ***

TRIANGLE LABORATORIES, INC.
Wet Lab Extraction and Observations
Project: 58987

Sample #	crd	TLI_Number..	Customer.Sample.Id.....	Init. pH...	NaOH Adj. mL..	pH.1.	H2SO4 Adj. mL...	pH.2.	Appearance.	Color.....	Odor...	Vol.	Entered.By.....	Date....	Time....	S
001		TLI Blank	TLI Blank	n/a	n/a	n/a	n/a	n/a	sand	tan	none	0	singletary	11/26/02	11:08:50	F
002		341-80-1	TEST PIT 2F	n/a	n/a	n/a	n/a	n/a	moist soil	black	none	0	singletary	11/26/02	11:08:50	F
003		TLI LCS	TLI LCS	n/a	n/a	n/a	n/a	n/a	sand	tan	none	0	singletary	11/26/02	11:08:50	F
004		TLI LCSD	TLI LCSD	n/a	n/a	n/a	n/a	n/a	sand	tan	none	0	singletary	11/26/02	11:08:50	F

*** End of Report ***

Extraction

Type: (Soxhlet) / Jar / Sep Funnel / Steam Dist / Cont LL / ASE / Waste Dilution / Solid Phase

S.O.P: 105 Version: 17

Time On: 16:20
Time Off: 8:20

Solvents/Acids	Lot Numbers
Toluene	025777
DCM	11/25/02

Comments / Observations: Sample 58987 #2 was a moist black soil w/ no odor. Sample #2 was a oily black soil w/ no odor. Sand Lot # 53-9-61-5 was used for the blank, lcs and lcsd. 11/25/02

Concentration

Analyst(s): AM 11/26/02

Type: (Rotovap) / KD / Speedvac

S.O.P: 124 Version: 15

Solvent Exchange	Lot Number
Heptane	[illegible]

Tridecane Lot # 7-125-3C6-F

Division: 20%/80% (Process 20%) 50%/50% 5ml/20ml (for lipid determination)

Comments / Observations: _____

Cleanup

MeCl2/Hept Solutions	
2% ID:	LL SPL-19-45-2
20% ID:	LL SPL-19-45-1
6% ID:	

S.O.P: DSP280 Version: 16 Analyst: NR 11/26/02
S.O.P: _____ Version: _____ Analyst: _____
S.O.P: _____ Version: _____ Analyst: _____

If DSP 280 needed complete the following areas:
Glasswool Lot #: _____ Heptane Lot#: _____
Sodium Sulfate Lot #: _____
Acid Coated Silica Gel Lot #: _____
50g used for: 100g used for:

Comments / Observations: _____

Transfers

Analyst(s): J. Thorpe 11/26/02

(1st) NR 11/26 (2nd) NR 11/26

S.O.P: DSP280 Version: ~~16~~ 10
272
Division: 90%/10%

Solvent	Lot Number
Heptane	026647

Comments: _____

Method: 8290
Matrix: Soil
Ext. Date: 11/25/02
Analyst: PS

Project-Sample ID / TLI ID			Gross Weight Before	Gross Weight After	Sample Size (g) / mL	PS 8320 C USF-ABS 5/28/03 11/25/02 16:15 0.1 ug/mL 20 uL	PS 8328 N USF-MX 4/29/03 11/25/02 16:15 0.01 ug/mL 40 uL	AA 8335I USF-C 09/26/03 11/26/02 08:55 0.01 ug/mL 20 uL	_____ _____ _____ __/__/__ __/__/__ __:__ ____ ug/mL ____ uL	Chemist Spike # Spike ID " Exp. " Date " Time Concen. Volume	Any Left Yes / No
58987	1	TLI Blank	N/A PS	11/25/02	10.00	PS		AA			Yes / No
58987	2	341-80-1	400.99	387.11	13.55	↓		↓			Yes / No
58987	3	TLI LCS	PS 11/25/02		10.00		PS				Yes / No
58987	4	TLI LCSD	N/A		10.00		PS				Yes / No
59002	2	341-95-1	137.65	136.19	1.46	PS		AA			Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No

TRIANGLE LABORATORIES, INC.

LAB CONTROL SPIKE RECOVERY ANALYSIS AND COMPARISON

Project: 58987
Matrix: SAND
Method: 8290

Isomer	U188303 ID: TLI Blank Sample (pg/g)		U188309 ID: TLI LCS With Spike (pg/g)	Percent Recovery	U188310 ID: TLI LCSD Spike Dup (pg/g)	Percent Recovery	Relative Percent Difference
2378-TCDD	ND		38.9	97.2	36.7	91.7	5.82
12378-PeCDD	ND		204	102	204	102	0.0
123478-HxCDD	ND		219	109	219	109	0.0
123678-HxCDD	ND		201	101	201	100	1.00
123789-HxCDD	ND		229	114	226	113	0.88
1234678-HpCDD	ND		189	94.7	190	94.8	0.11
OCDD	[0.34]	1.7	410	102	420	105	2.90
2378-TCDF	ND		37.0	92.4	36.2	90.5	2.08
12378-PeCDF	[0.10]	0.50	177	88.5	176	87.8	0.79
23478-PeCDF	ND		174	87.1	187	93.4	6.98
123478-HxCDF	0.15		230	115	212	106	8.14
123678-HxCDF	ND		213	106	207	103	2.87
234678-HxCDF	ND		234	117	219	109	7.08
123789-HxCDF	ND		215	108	204	102	5.71
1234678-HpCDF	ND		251	125	246	123	1.61
1234789-HpCDF	ND		219	109	211	105	3.74
OCDF	0.49		376	93.8	398	99.4	5.80

ND: Not Detected
NA: Not Applicable
[..]: EMPC Value

MILES 4.22.16
GRY_PSUM v1.11

Processed By: QEM Date: 11/29/02

Percent Recovery QC Limits: 70 to 130 percent.
Relative Percent Difference QC Limits: +/- 20 percent.

Nominal Spike Levels:

- TCDD/TCDF...: 0.4 ng
- PeCDD/PeCDF: 2.0 ng
- HxCDD/HxCDF: 2.0 ng
- HpCDD/HpCDF: 2.0 ng
- OCDD/OCDF...: 4.0 ng

TLI Project: 58987 — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **TLI Blank** — Analysis File: **U188303**

Client Project:	**Radford Army Ammunition Plant**				
Sample Matrix:	**SAND**	Date Received:	/ /	Spike File:	**SPMIT32S**
TLI ID:	**TLI Blank**	Date Extracted:	**11/25/2002**	ICal:	**UF57092**
		Date Analyzed:	**11/27/2002**	ConCal:	**U021882**
Sample Size:	**10.000 g**	Dilution Factor:	**n/a**	% Moisture:	**n/a**
Dry Weight:	**n/a**	Blank File:	**U188303**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JSY**	% Solids:	**n/a**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.08				
1,2,3,7,8-PeCDD	ND	0.1				
1,2,3,4,7,8-HxCDD	ND	0.09				
1,2,3,6,7,8-HxCDD	ND	0.09				
1,2,3,7,8,9-HxCDD	ND	0.09				
1,2,3,4,6,7,8-HpCDD	ND	0.1				
1,2,3,4,6,7,8,9-OCDD	EMPC		0.34			J
2,3,7,8-TCDF	ND	0.06				
1,2,3,7,8-PeCDF	EMPC		0.10			J
2,3,4,7,8-PeCDF	ND	0.07				
1,2,3,4,7,8-HxCDF	0.15			1.15	33:25	J
1,2,3,6,7,8-HxCDF	ND	0.05				
2,3,4,6,7,8-HxCDF	ND	0.06				
1,2,3,7,8,9-HxCDF	ND	0.07				
1,2,3,4,6,7,8-HpCDF	ND	0.07				
1,2,3,4,7,8,9-HpCDF	ND	0.1				
1,2,3,4,6,7,8,9-OCDF	0.49			0.85	41:18	J

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	EMPC			0.15	
Total PeCDD	ND		0.1		
Total HxCDD	EMPC			0.62	
Total HpCDD	ND		0.1		
Total TCDF	ND		0.06		
Total PeCDF	EMPC			0.10	
Total HxCDF	0.15	1			
Total HpCDF	ND		0.09		

MIT3_PSR v1.00, LARS 6.25.05

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Printed: 12:07 11/29/2002

TLI Project: **58987**
Client Sample: **TLI Blank**

Toxicity Equivalents Report
Analysis File: **U188303**

Client Project:	**Radford Army Ammunition Plant**				
Sample Matrix:	**SAND**	Date Received:	**11/22/02**	Spike File:	**SPMIT32S**
TLI ID:	**TLI Blank**	Date Extracted:	**11/25/02**	ICal:	**UF57092**
		Date Analyzed:	**11/27/02**	ConCal:	**U021882**
Sample Size:	**10.000 g**	Dilution Factor:	**1**	% Moisture:	**n/a**
Dry Weight:	**n/a**	Blank File:	**U188303**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JSY**	% Solids:	**n/a**

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.08}	x	1.	=	0.08
1,2,3,7,8-PeCDD	{0.1}	x	0.5	=	0.05
1,2,3,4,7,8-HxCDD	{0.09}	x	0.1	=	0.009
1,2,3,6,7,8-HxCDD	{0.09}	x	0.1	=	0.009
1,2,3,7,8,9-HxCDD	{0.09}	x	0.1	=	0.009
1,2,3,4,6,7,8-HpCDD	{0.1}	x	0.01	=	0.001
1,2,3,4,6,7,8,9-OCDD	[0.34]	x	0.001	=	0.00034
TOTAL PCDD					0.16
2,3,7,8-TCDF	{0.06}	x	0.1	=	0.006
1,2,3,7,8-PeCDF	[0.10]	x	0.05	=	0.0050
2,3,4,7,8-PeCDF	{0.07}	x	0.5	=	0.04
1,2,3,4,7,8-HxCDF	0.15	x	0.1	=	0.015
1,2,3,6,7,8-HxCDF	{0.05}	x	0.1	=	0.005
2,3,4,6,7,8-HxCDF	{0.06}	x	0.1	=	0.006
1,2,3,7,8,9-HxCDF	{0.07}	x	0.1	=	0.007
1,2,3,4,6,7,8-HpCDF	{0.07}	x	0.01	=	0.0007
1,2,3,4,7,8,9-HpCDF	{0.1}	x	0.01	=	0.001
1,2,3,4,6,7,8,9-OCDF	0.49	x	0.001	=	0.00049
TOTAL PCDF					0.09

Total EPA TEFs, 1989a: 0.24 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

GRY_TEF v1.08, MILES 4.22.16

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Printed: 13:27 11/29/02

Data File	U188303	U188304	U188309	U188310
Sample ID	TLI Blank	TEST PIT 2F	TLI LCS	TLI LCSD
Units	pg/g	pg/g	pg/g	pg/g
Extraction Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Analysis Date	11/27/2002	11/27/2002	11/27/2002	11/27/2002
Instrument	U	U	U	U
Matrix	SAND	SOIL	SAND	SAND
Extraction Type				
Analytes				
2378-TCDD	(0.08)	(0.3)	38.9	36.7
12378-PeCDD	(0.1)	(0.5)	204	204
123478-HxCDD	(0.09)	1.3 J	219	219
123678-HxCDD	(0.09)	10.6	201	201
123789-HxCDD	(0.09)	3.9 J	229	226
1234678-HpCDD	(0.1)	431	189	190
OCDD	(0.34) J 1.7	7250 E	410	420
2378-TCDF	(0.06)	2.5	37.0	36.2
12378-PeCDF	(0.10) J 0.5	(0.3) ND ~~0.2~~	177	176
23478-PeCDF	(0.07)	(0.38) J	174	187
123478-HxCDF	0.15 J 0.75	2.3 JB	230	212
123678-HxCDF	(0.05)	1.1 J	213	207
234678-HxCDF	(0.06)	(1.2) J	234	219
123789-HxCDF	(0.07)	(0.6)	215	204
1234678-HpCDF	(0.07)	44.3	251	246
1234789-HpCDF	(0.1)	2.9 J	219	211
OCDF	0.49 J 2.45	124	376	398
TOTAL TCDD	(0.15)	(0.3)		
TOTAL PeCDD	(0.1)	(2.1)		
TOTAL HxCDD	(0.62)	77.1		
TOTAL HpCDD	(0.1)	907		
TOTAL TCDF	(0.06)	4.4 X		
TOTAL PeCDF	(0.10)	(13.2) X		
TOTAL HxCDF	0.15	48.2 X		
TOTAL HpCDF	(0.09)	174 X		
Other Standards Percent Recovery Summary (% Rec)				
37Cl-TCDD	64.6	89.7	58.7	51.9
Other Standards Percent Recovery Summary (% Rec)				
13C12-PeCDF 234	70.2	71.3	61.4	56.3
13C12-HxCDF 478	98.9	99.8	103	97.7
13C12-HxCDD 478	100	93.3	95.5	89.8
13C12-HpCDF 789	96.9	62.8	66.0	68.5
Other Standards Percent Recovery Summary (% Rec)				
13C12-HxCDF 789	102	100	97.4	95.6
13C12-HxCDF 234	105	97.9	109	103
Internal Standards Percent Recovery Summary (% Rec)				
13C12-2378-TCDF	80.6	81.7	77.3	72.0
13C12-2378-TCDD	76.8	85.9	72.2	66.7

Data File	U188303	U188304	U188309	U188310
Sample ID	TLI Blank	TEST PIT 2F	TLI LCS	TLI LCSD
Units	pg/g	pg/g	pg/g	pg/g
Extraction Date	11/25/2002	11/25/2002	11/25/2002	11/25/2002
Analysis Date	11/27/2002	11/27/2002	11/27/2002	11/27/2002
Instrument	U	U	U	U
Matrix	SAND	SOIL	SAND	SAND
Extraction Type				
Internal Standards	Percent Recovery	Summary (% Rec)		
13C12-PeCDF 123	73.0	80.7	65.8	58.3
13C12-PeCDD 123	78.3	81.4	68.6	58.8
13C12-HxCDF 678	99.0	97.2	96.9	98.3
13C12-HxCDD 678	96.2	94.0	90.2	83.8
13C12-HpCDF 678	98.5	71.4	69.8	75.7
13C12-HpCDD 678	104	65.5	68.7	77.1
13C12-OCDD	102	44.8	47.0	49.9

{Estimated Maximum Possible Concentration}, (Detection Limit).

Data File	P024383
Sample ID	TEST PIT 2F
Units	pg/g
Extraction Date	11/25/2002
Analysis Date	11/28/2002
Instrument	P
Matrix	SOIL
Extraction Type	

Analytes	
2378-TCDF	{1.5}

Internal Standards Percent Recovery Summary (% Rec)

13C12-2378-TCDF	87.7

{Estimated Maximum Possible Concentration}.

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

APPENDIX G.2.2

ADDITIONAL INVESTIGATIONS SOIL SAMPLING
2006

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DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-28 **Fraction:** PCBs, DRO, GRO, & Metals

Lab: TriMatrix **Project Name:** Radford SWMU 40/71

Reviewer: RA **Date:** May 31, 2006

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: For the PCB analyses, surrogates were diluted out for sample 71SB14B. No data qualifying action was necessary since this sample was analyzed at dilution factor 20.

The field duplicate pair 71SB15A/Dup-3 displayed results outside the control limits for PCB-1254. These results were flagged "J,f" in these samples.

The relative percent differences between the two analytical column concentrations were greater than the control limit (i.e., 40%) for several compounds in several samples. These compounds were flagged "J,g" in the associated field samples.

Sample 71SB14B displayed a concentration for PCB-1254 that exceeded the calibration range of the instrument and was flagged "E" by the laboratory. This result was flagged "J,q." This sample was re-analyzed at a dilution factor of 20 with an acceptable result that should be used for data interpretation.

For the metals analyses by 6020, the method blanks displayed positive detections for antimony, arsenic, copper, nickel, and vanadium. The associated field sample results less than five times the blank concentrations were flagged "B,p". One continuing calibration blank also displayed a positive detection for arsenic. The associated field sample results were greater than five times the associated calibration blank concentration and no data qualifying action was required.

The matrix spike pair performed on sample 71SS12B displayed recoveries less than the lower control limit (i.e., 75%) for arsenic (72%/72%), copper (74%), and selenium (73%/71%). All associated field sample results were positive and were flagged "L,m", unless previously flagged for method blank contamination. The post digestion spike performed on this parent sample displayed a recovery less than the lower control limit (i.e., 75%) for selenium at 74%. No data qualifying action is taken based solely on a post digestion spike anomaly.

The serial dilution performed on sample 71SS12B displayed percent differences greater than the control limit (i.e., 10%) for copper at 19.6%, nickel at 17.0%, and vanadium at

12.90%. All associated field sample results were positive and were flagged "J,s", unless previously flagged for matrix spike failure.

The field duplicate pair (71SB15A and DUP-3) displayed relative percent differences greater than the control limit (i.e., 50%) for arsenic at 198.2%, copper at 94.5%, lead at 117.9%, and vanadium at 189.5%. These results were flagged "J,f" in these two samples, unless previously flagged for other anomalies.

For the metals analyses by 6010, the method blanks displayed positive detections for barium, calcium, iron, potassium, and zinc. The associated field sample results less than five times the blank concentrations were flagged "B,p". The calibration blanks displayed low level detections for several analytes. The associated field sample results were greater than five times the associated calibration blank concentrations and no data qualifying action was required.

The associated equipment blank EQBK71 displayed positive detections for iron at 41 ug/L and potassium at 44 ug/L. The associated field sample results were positive and greater than five times the equipment blank concentration. No data qualifying action was required.

The matrix spike pair performed on sample 71SS12B displayed recoveries less than the lower control limit (i.e., 75%) for calcium (18%/18%), chromium (22%/38%), cobalt (47%), and zinc (62%). All associated field sample results were positive and were flagged "L,m", unless previously flagged for method blank contamination. The matrix spike pair also displayed recoveries less than the lower control limit for sodium (74%/74%). Positive associated field sample results were flagged "L,m" and non-detects were flagged "UL,m". The post digestion spike performed on this parent sample displayed a recovery less than the lower control limit (i.e., 75%) for manganese at 65%. No data qualifying action is taken based solely on a post digestion spike anomaly.

The serial dilution performed on sample 71SS12B displayed a percent difference greater than the control limit (i.e., 10%) for zinc at 14.3%. All associated field sample results were previously flagged for a matrix spike anomaly and no further data qualifying action was required.

The field duplicate pair (71SB15A and DUP-3) displayed relative percent differences greater than the control limit (i.e., 50%) for calcium at 50.7% and potassium at 53%. These results were flagged "J,f" in these two samples, unless previously flagged for other anomalies.

The method blank displayed a positive detection for mercury at 0.0068 mg/kg. Positive results less than five times the blank concentration were flagged "B,p" in the associated field samples. The associated equipment blank EQBK71 displayed a positive detection for mercury at 0.071 ug/L. The associated positive field sample results less than five times the equipment blank concentration were flagged "B,x".

For the GRO analyses, sample EQBK71 was extracted five days after the holding time had expired. The associated field sample result was non-detect and was flagged "UL,h."

The continuing calibration analyzed on 05/04/06 at 1036 displayed a percent difference greater than the control limit (i.e., 15%) with a negative bias for GRO at 15.8%. The associated field sample results were non-detect and were flagged "UJ,c".

Correctable Anomalies: None.

Comments: It should be noted that the sample with field sample ID Dup-4 was identified as Dup-1 on the chain of custody forms. The laboratory reported the results as Dup-1 as recorded on the chain of custody forms.

No anomalies were encountered if a given fraction was not mentioned. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Rayan

SAMPLE ID SUMMARY

USEPA-8082

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Client Sample Id:	Lab Sample Id:
71SB14A	0604436-01
71SB14B	0604436-02
71SB14B	0604436-02RE1
71SB14C	0604436-03
71SB13A	0604436-04
71SB13B	0604436-05
71SB13C	0604436-06
Dup-2	0604436-07
71SS11B	0604436-08
71SS13B	0604436-09
71SB12A	0604436-10
71SB12B	0604436-11
71SB12C	0604436-12
71SS12B	0604436-13
71SB15A	0604436-14
71SB15B	0604436-15
71SB15C	0604436-16
71SB16A	0604436-17
71SB16B	0604436-18
71SB16C	0604436-19
Dup-3	0604436-20
40SS9	0604436-21
Dup-1	0604436-22
40SS17	0604436-23
40SS8	0604436-24
40SS16	0604436-25
40SS15	0604436-26
40SS7	0604436-27
40SS14	0604436-28
40SS6	0604436-29
40SS18	0604436-30
40SS10	0604436-31
40SS11	0604436-32
Dup-5	0604436-33
40SS12	0604436-34
40SS13	0604436-35
EQBK71	0604436-36

ANALYSIS DATA SHEET

71SB14A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-01 File ID: A166079-0

Sampled: 04/20/06 16:50 Prepared: 04/27/06 09:09 Analyzed: 05/01/06 20:56

Solids: 82.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.080	0.080	0.0052	U
11104-28-2	PCB-1221	1	0.080	0.080	0.015	U
11141-16-5	PCB-1232	1	0.080	0.080	0.0055	U
53469-21-9	PCB-1242	1	0.040	0.040	0.0076	U
12672-29-6	PCB-1248	1	0.040	0.040	0.0045	U
11097-69-1	PCB-1254	1	0.31	0.040	0.0073	
11096-82-5	PCB-1260	1	0.080	0.080	0.0054	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0407	0.0460	113	30 - 139	
Tetrachloro-m-xylene		0.0407	0.0347	85	32 - 129	

* Values outside of QC limits

00139

ANALYSIS DATA SHEET

71SB14B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-02 File ID: A166080-0

Sampled: 04/20/06 16:55 Prepared: 04/27/06 09:09 Analyzed: 05/01/06 21:14

Solids: 77.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.086	0.086	0.0056	U
11104-28-2	PCB-1221	1	0.086	0.086	0.016	U
11141-16-5	PCB-1232	1	0.086	0.086	0.0058	U
53469-21-9	PCB-1242	1	0.043	0.043	0.0081	U
12672-29-6	PCB-1248	1	0.043	0.043	0.0048	U
~~11097-69-1~~	~~PCB-1254~~	~~1~~	~~3.7~~	0.043	0.0078	E
11096-82-5	PCB-1260	1	0.086	0.086	0.0057	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0433	0.0496	115	30 - 139	
Tetrachloro-m-xylene		0.0433	0.0387	89	32 - 129	

Use DF=20

J, B

* Values outside of QC limits

ANALYSIS DATA SHEET

71SB14B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-02RE1 File ID: A166216-0

Sampled: 04/20/06 16:55 Prepared: 04/27/06 09:09 Analyzed: 05/04/06 13:45

Solids: 77.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	20	1.7	1.7	0.11	U
11104-28-2	PCB-1221	20	1.7	1.7	0.31	U
11141-16-5	PCB-1232	20	1.7	1.7	0.12	U
53469-21-9	PCB-1242	20	0.86	0.86	0.16	U
12672-29-6	PCB-1248	20	0.86	0.86	0.096	U
11097-69-1	PCB-1254	20	5.4	0.86	0.16	✓J,8
11096-82-5	PCB-1260	20	1.7	1.7	0.11	U

* Values outside of QC limits

use only if reqd by RA

0817

ANALYSIS DATA SHEET

71SB14C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-03 File ID: A166081-0

Sampled: 04/21/06 11:00 Prepared: 04/27/06 09:09 Analyzed: 05/01/06 21:31

Solids: 80.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.082	0.082	0.0054	U
11104-28-2	PCB-1221	1	0.082	0.082	0.015	U
11141-16-5	PCB-1232	1	0.082	0.082	0.0056	U
53469-21-9	PCB-1242	1	0.041	0.041	0.0078	U
12672-29-6	PCB-1248	1	0.082	0.041	0.0046	
11097-69-1	PCB-1254	1	0.54	0.041	0.0075	J,g
11096-82-5	PCB-1260	1	0.070	0.082	0.0055	J
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0417	0.0468	112	30 - 139	
Tetrachloro-m-xylene		0.0417	0.0348	83	32 - 129	

* Values outside of QC limits

00166

ANALYSIS DATA SHEET

71SB13A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-04 File ID: A166082-0

Sampled: 04/20/06 15:50 Prepared: 04/27/06 09:09 Analyzed: 05/01/06 21:49

Solids: 82.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q	
12674-11-2	PCB-1016	1	0.080	0.080	0.0052	U	
11104-28-2	PCB-1221	1	0.080	0.080	0.015	U	
11141-16-5	PCB-1232	1	0.080	0.080	0.0055	U	
53469-21-9	PCB-1242	1	0.040	0.040	0.0076	U	
12672-29-6	PCB-1248	1	0.45	0.040	0.0045		J,g
11097-69-1	PCB-1254	1	0.46	0.040	0.0073		J,g
11096-82-5	PCB-1260	1	0.092	0.080	0.0054		
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**	
Decachlorobiphenyl		0.0407	0.0437	107	30 - 139		
Tetrachloro-m-xylene		0.0407	0.0338	83	32 - 129		

* Values outside of QC limits

: 60161

ANALYSIS DATA SHEET

71SB13B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-05 File ID: A166083-0

Sampled: 04/20/06 16:15 Prepared: 04/27/06 09:09 Analyzed: 05/01/06 22:07

Solids: 73.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.090	0.090	0.0059	U
11104-28-2	PCB-1221	1	0.090	0.090	0.017	U
11141-16-5	PCB-1232	1	0.090	0.090	0.0062	U
53469-21-9	PCB-1242	1	0.045	0.045	0.0085	U
12672-29-6	PCB-1248	1	0.045	0.045	0.0051	U
11097-69-1	PCB-1254	1	0.022	0.045	0.0082	J
11096-82-5	PCB-1260	1	0.090	0.090	0.0060	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0457	0.0518	113	30 - 139	
Tetrachloro-m-xylene		0.0457	0.0426	93	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

71SB13C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-06 File ID: A166084-0

Sampled: 04/20/06 16:30 Prepared: 04/27/06 09:09 Analyzed: 05/01/06 22:25

Solids: 72.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.092	0.092	0.0060	U
11104-28-2	PCB-1221	1	0.092	0.092	0.017	U
11141-16-5	PCB-1232	1	0.092	0.092	0.0062	U
53469-21-9	PCB-1242	1	0.046	0.046	0.0086	U
12672-29-6	PCB-1248	1	0.046	0.046	0.0051	U
11097-69-1	PCB-1254	1	0.013	0.046	0.0083	J
11096-82-5	PCB-1260	1	0.092	0.092	0.0061	U
System Monitoring Compound		ADDED (mg/kg dry)	CONC (mg/kg dry)	% Rec.	QC Limits	Q
Decachlorobiphenyl		0.0463	0.0510	110	30 - 139	
Tetrachloro-m-xylene		0.0463	0.0437	94	32 - 129	

* Values outside of QC limits

00285

ANALYSIS DATA SHEET

Dup-2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-07 File ID: A166085-0

Sampled: 04/20/06 00:00 Prepared: 04/27/06 09:09 Analyzed: 05/01/06 22:43

Solids: 70.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.094	0.094	0.0061	U
11104-28-2	PCB-1221	1	0.094	0.094	0.017	U
11141-16-5	PCB-1232	1	0.094	0.094	0.0064	U
53469-21-9	PCB-1242	1	0.047	0.047	0.0089	U
12672-29-6	PCB-1248	1	0.047	0.047	0.0053	U
11097-69-1	PCB-1254	1	0.047	0.047	0.0086	U
11096-82-5	PCB-1260	1	0.094	0.094	0.0063	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0476	0.0525	110	30 - 139	
Tetrachloro-m-xylene		0.0476	0.0452	95	32 - 129	

* Values outside of QC limits

: 00214

ANALYSIS DATA SHEET

71SS11B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-08 File ID: A166086-0

Sampled: 04/20/06 18:00 Prepared: 04/27/06 09:09 Analyzed: 05/01/06 23:00

Solids: 68.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.097	0.097	0.0063	U
11104-28-2	PCB-1221	1	0.097	0.097	0.018	U
11141-16-5	PCB-1232	1	0.097	0.097	0.0066	U
53469-21-9	PCB-1242	1	0.049	0.049	0.0091	U
12672-29-6	PCB-1248	1	0.049	0.049	0.0054	U
11097-69-1	PCB-1254	1	0.049	0.049	0.0088	U
11096-82-5	PCB-1260	1	0.097	0.097	0.0065	U
System Monitoring Compound		ADDED (mg/kg dry)	CONC (mg/kg dry)	% Rec.	QC Limits	Q
Decachlorobiphenyl		0.0490	0.0553	113	30 - 139	
Tetrachloro-m-xylene		0.0490	0.0461	94	32 - 129	

* Values outside of QC limits

00223

ANALYSIS DATA SHEET

71SS13B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-09 File ID: A166090-0

Sampled: 04/20/06 19:15 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 00:12

Solids: 73.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.090	0.090	0.0059	U
11104-28-2	PCB-1221	1	0.090	0.090	0.017	U
11141-16-5	PCB-1232	1	0.090	0.090	0.0062	U
53469-21-9	PCB-1242	1	0.045	0.045	0.0085	U
12672-29-6	PCB-1248	1	0.045	0.045	0.0051	U
11097-69-1	PCB-1254	1	0.045	0.045	0.0082	U
11096-82-5	PCB-1260	1	0.090	0.090	0.0060	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0457	0.0489	107	30 - 139	
Tetrachloro-m-xylene		0.0457	0.0432	95	32 - 129	

* Values outside of QC limits

00292

ANALYSIS DATA SHEET

71SB12A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-10 File ID: A166091-0

Sampled: 04/20/06 17:15 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 00:29

Solids: 75.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.088	0.088	0.0057	U
11104-28-2	PCB-1221	1	0.088	0.088	0.016	U
11141-16-5	PCB-1232	1	0.088	0.088	0.0060	U
53469-21-9	PCB-1242	1	0.044	0.044	0.0083	U
12672-29-6	PCB-1248	1	0.044	0.044	0.0049	U
11097-69-1	PCB-1254	1	0.044	0.044	0.0080	U
11096-82-5	PCB-1260	1	0.088	0.088	0.0059	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0444	0.0517	116	30 - 139	
Tetrachloro-m-xylene		0.0444	0.0436	98	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

71SB12B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-11 File ID: A166092-0

Sampled: 04/20/06 17:30 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 00:47

Solids: 67.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.099	0.099	0.0064	U
11104-28-2	PCB-1221	1	0.099	0.099	0.018	U
11141-16-5	PCB-1232	1	0.099	0.099	0.0067	U
53469-21-9	PCB-1242	1	0.049	0.049	0.0093	U
12672-29-6	PCB-1248	1	0.049	0.049	0.0055	U
11097-69-1	PCB-1254	1	0.049	0.049	0.0090	U
11096-82-5	PCB-1260	1	0.099	0.099	0.0066	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0498	0.0551	111	30 - 139	
Tetrachloro-m-xylene		0.0498	0.0464	93	32 - 129	

* Values outside of QC limits

00258

ANALYSIS DATA SHEET

71SB12C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-12 File ID: A166093-0

Sampled: 04/20/06 17:45 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 01:05

Solids: 68.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.097	0.097	0.0063	U
11104-28-2	PCB-1221	1	0.097	0.097	0.018	U
11141-16-5	PCB-1232	1	0.097	0.097	0.0066	U
53469-21-9	PCB-1242	1	0.049	0.049	0.0091	U
12672-29-6	PCB-1248	1	0.049	0.049	0.0054	U
11097-69-1	PCB-1254	1	0.049	0.049	0.0088	U
11096-82-5	PCB-1260	1	0.097	0.097	0.0065	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0490	0.0568	116	30 - 139	
Tetrachloro-m-xylene		0.0490	0.0462	94	32 - 129	

* Values outside of QC limits

68253

ANALYSIS DATA SHEET

71SS12B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-13 File ID: A166094-0

Sampled: 04/20/06 13:30 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 01:23

Solids: 68.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.097	0.097	0.0063	U
11104-28-2	PCB-1221	1	0.097	0.097	0.018	U
11141-16-5	PCB-1232	1	0.097	0.097	0.0066	U
53469-21-9	PCB-1242	1	0.049	0.049	0.0091	U
12672-29-6	PCB-1248	1	0.049	0.049	0.0054	U
11097-69-1	PCB-1254	1	0.049	0.049	0.0088	U
11096-82-5	PCB-1260	1	0.097	0.097	0.0065	U
System Monitoring Compound		ADDED (mg/kg dry)	CONC (mg/kg dry)	% Rec.	QC Limits	Q
Decachlorobiphenyl		0.0490	0.0560	114	30 - 139	
Tetrachloro-m-xylene		0.0490	0.0480	98	32 - 129	

* Values outside of QC limits

: 66256

ANALYSIS DATA SHEET

71SB15A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-14 File ID: A166217-0

Sampled: 04/21/06 10:15 Prepared: 04/27/06 09:09 Analyzed: 05/04/06 14:03

Solids: 84.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	4	0.31	0.31	0.020	U
11104-28-2	PCB-1221	4	0.31	0.31	0.058	U
11141-16-5	PCB-1232	4	0.31	0.31	0.021	U
53469-21-9	PCB-1242	4	0.16	0.16	0.030	U
12672-29-6	PCB-1248	4	0.16	0.16	0.018	U
11097-69-1	PCB-1254	4	0.90	0.16	0.029	J,F
11096-82-5	PCB-1260	4	0.31	0.31	0.021	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0397	0.0337	85	30 - 139	
Tetrachloro-m-xylene		0.0397	0.0294	74	32 - 129	

* Values outside of QC limits

00277

ANALYSIS DATA SHEET

71SB15B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-15 File ID: A166096-0

Sampled: 04/21/06 10:30 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 01:58

Solids: 76.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.087	0.087	0.0057	U
11104-28-2	PCB-1221	1	0.087	0.087	0.016	U
11141-16-5	PCB-1232	1	0.087	0.087	0.0059	U
53469-21-9	PCB-1242	1	0.043	0.043	0.0082	U
12672-29-6	PCB-1248	1	0.21	0.043	0.0049	J,g
11097-69-1	PCB-1254	1	0.61	0.043	0.0079	J,g
11096-82-5	PCB-1260	1	0.087	0.087	0.0058	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0439	0.0515	117	30 - 139	
Tetrachloro-m-xylene		0.0439	0.0371	85	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

71SB15C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-16 File ID: A166097-0

Sampled: 04/21/06 10:45 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 02:16

Solids: 68.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.097	0.097	0.0063	U
11104-28-2	PCB-1221	1	0.097	0.097	0.018	U
11141-16-5	PCB-1232	1	0.097	0.097	0.0066	U
53469-21-9	PCB-1242	1	0.049	0.049	0.0091	U
12672-29-6	PCB-1248	1	0.28	0.049	0.0054	
11097-69-1	PCB-1254	1	0.58	0.049	0.0088	J,8
11096-82-5	PCB-1260	1	0.12	0.097	0.0065	
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0490	0.0446	91	30 - 139	
Tetrachloro-m-xylene		0.0490	0.0360	73	32 - 129	

* Values outside of QC limits

08361

ANALYSIS DATA SHEET

71SB16A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-17 File ID: A166098-0

Sampled: 04/21/06 09:30 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 02:34

Solids: 85.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.078	0.078	0.0051	U
11104-28-2	PCB-1221	1	0.078	0.078	0.014	U
11141-16-5	PCB-1232	1	0.078	0.078	0.0053	U
53469-21-9	PCB-1242	1	0.039	0.039	0.0073	U
12672-29-6	PCB-1248	1	0.039	0.039	0.0044	U
11097-69-1	PCB-1254	1	0.15	0.039	0.0071	
11096-82-5	PCB-1260	1	0.078	0.078	0.0052	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0392	0.0459	117	30 - 139	
Tetrachloro-m-xylene		0.0392	0.0359	92	32 - 129	

* Values outside of QC limits

: 66316

ANALYSIS DATA SHEET

71SB16B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-18 File ID: A166099-0

Sampled: 04/21/06 09:45 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 02:52

Solids: 74.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.089	0.089	0.0058	U
11104-28-2	PCB-1221	1	0.089	0.089	0.016	U
11141-16-5	PCB-1232	1	0.089	0.089	0.0061	U
53469-21-9	PCB-1242	1	0.045	0.045	0.0084	U
12672-29-6	PCB-1248	1	0.045	0.045	0.0050	U
11097-69-1	PCB-1254	1	0.045	0.045	0.0081	U
11096-82-5	PCB-1260	1	0.089	0.089	0.0059	U
System Monitoring Compound		ADDED (mg/kg dry)	CONC (mg/kg dry)	% Rec.	QC Limits	Q
Decachlorobiphenyl		0.0450	0.0495	110	30 - 139	
Tetrachloro-m-xylene		0.0450	0.0408	91	32 - 129	

* Values outside of QC limits

68331

ANALYSIS DATA SHEET

71SB16C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-19 File ID: A166101-0

Sampled: 04/21/06 10:00 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 03:27

Solids: 65.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.10	0.10	0.0066	U
11104-28-2	PCB-1221	1	0.10	0.10	0.019	U
11141-16-5	PCB-1232	1	0.10	0.10	0.0069	U
53469-21-9	PCB-1242	1	0.051	0.051	0.0095	U
12672-29-6	PCB-1248	1	0.051	0.051	0.0057	U
11097-69-1	PCB-1254	1	0.051	0.051	0.0092	U
11096-82-5	PCB-1260	1	0.10	0.10	0.0068	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0513	0.0541	105	30 - 139	
Tetrachloro-m-xylene		0.0513	0.0466	91	32 - 129	

* Values outside of QC limits

: 00346

ANALYSIS DATA SHEET

Dup-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-20 File ID: A166102-0

Sampled: 04/21/06 00:00 Prepared: 04/27/06 09:09 Analyzed: 05/02/06 03:45

Solids: 86.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604702 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.077	0.077	0.0050	U
11104-28-2	PCB-1221	1	0.077	0.077	0.014	U
11141-16-5	PCB-1232	1	0.077	0.077	0.0052	U
53469-21-9	PCB-1242	1	0.038	0.038	0.0072	U
12672-29-6	PCB-1248	1	0.037	0.038	0.0043	J
11097-69-1	PCB-1254	1	0.21	0.038	0.0070	J,F
11096-82-5	PCB-1260	1	0.077	0.077	0.0051	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0388	0.0454	117	30 - 139	
Tetrachloro-m-xylene		0.0388	0.0356	92	32 - 129	

* Values outside of QC limits

00349

ANALYSIS DATA SHEET

40SS9

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-21 File ID: A166220-0

Sampled: 04/21/06 15:00 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 14:56

Solids: 68.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.097	0.097	0.0063	U
11104-28-2	PCB-1221	1	0.097	0.097	0.018	U
11141-16-5	PCB-1232	1	0.097	0.097	0.0066	U
53469-21-9	PCB-1242	1	0.049	0.049	0.0091	U
12672-29-6	PCB-1248	1	0.049	0.049	0.0054	U
11097-69-1	PCB-1254	1	0.026	0.049	0.0088	J
11096-82-5	PCB-1260	1	0.022	0.097	0.0065	J
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0490	0.0498	102	30 - 139	
Tetrachloro-m-xylene		0.0490	0.0418	85	32 - 129	

J,J

* Values outside of QC limits

: 003564

ANALYSIS DATA SHEET

Dup-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-22 File ID: A166221-0

Sampled: 04/21/06 00:00 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 15:14

Solids: 71.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.093	0.093	0.0061	U
11104-28-2	PCB-1221	1	0.093	0.093	0.017	U
11141-16-5	PCB-1232	1	0.093	0.093	0.0063	U
53469-21-9	PCB-1242	1	0.046	0.046	0.0087	U
12672-29-6	PCB-1248	1	0.046	0.046	0.0052	U
11097-69-1	PCB-1254	1	0.054	0.046	0.0085	
11096-82-5	PCB-1260	1	0.093	0.093	0.0062	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0469	0.0483	103	30 - 139	
Tetrachloro-m-xylene		0.0469	0.0403	86	32 - 129	

* Values outside of QC limits

00573

ANALYSIS DATA SHEET

40SS17

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-23 File ID: A166222-0

Sampled: 04/21/06 15:15 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 15:31

Solids: 67.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.099	0.099	0.0064	U
11104-28-2	PCB-1221	1	0.099	0.099	0.018	U
11141-16-5	PCB-1232	1	0.099	0.099	0.0067	U
53469-21-9	PCB-1242	1	0.049	0.049	0.0093	U
12672-29-6	PCB-1248	1	0.049	0.049	0.0055	U
11097-69-1	PCB-1254	1	0.16	0.049	0.0090	
11096-82-5	PCB-1260	1	0.15	0.099	0.0066	
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0498	0.0516	104	30 - 139	
Tetrachloro-m-xylene		0.0498	0.0436	88	32 - 129	

* Values outside of QC limits

68334

ANALYSIS DATA SHEET

40SS8

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-24 File ID: A166223-0

Sampled: 04/21/06 15:20 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 15:49

Solids: 66.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.10	0.10	0.0065	U
11104-28-2	PCB-1221	1	0.10	0.10	0.018	U
11141-16-5	PCB-1232	1	0.10	0.10	0.0068	U
53469-21-9	PCB-1242	1	0.050	0.050	0.0094	U
12672-29-6	PCB-1248	1	0.050	0.050	0.0056	U
11097-69-1	PCB-1254	1	0.21	0.050	0.0091	
11096-82-5	PCB-1260	1	0.20	0.10	0.0067	
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0505	0.0483	96	30 - 139	
Tetrachloro-m-xylene		0.0505	0.0414	82	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

40SS16

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-25 File ID: A166224-0

Sampled: 04/21/06 15:30 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 16:07

Solids: 65.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.10	0.10	0.0066	U
11104-28-2	PCB-1221	1	0.10	0.10	0.019	U
11141-16-5	PCB-1232	1	0.10	0.10	0.0069	U
53469-21-9	PCB-1242	1	0.051	0.051	0.0095	U
12672-29-6	PCB-1248	1	0.051	0.051	0.0057	U
11097-69-1	PCB-1254	1	0.44	0.051	0.0092	
11096-82-5	PCB-1260	1	0.23	0.10	0.0068	
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0513	0.0529	103	30 - 139	
Tetrachloro-m-xylene		0.0513	0.0425	83	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

40SS15

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-26 File ID: A166226-0

Sampled: 04/21/06 15:35 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 16:43

Solids: 64.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.10	0.10	0.0067	U
11104-28-2	PCB-1221	1	0.10	0.10	0.019	U
11141-16-5	PCB-1232	1	0.10	0.10	0.0070	U
53469-21-9	PCB-1242	1	0.052	0.052	0.0097	U
12672-29-6	PCB-1248	1	0.052	0.052	0.0058	U
11097-69-1	PCB-1254	1	0.13	0.052	0.0094	
11096-82-5	PCB-1260	1	0.072	0.10	0.0069	J
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0521	0.0536	103	30 - 139	
Tetrachloro-m-xylene		0.0521	0.0424	81	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

40SS7

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-27 File ID: A166227-0

Sampled: 04/21/06 15:45 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 17:00

Solids: 67.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.099	0.099	0.0064	U
11104-28-2	PCB-1221	1	0.099	0.099	0.018	U
11141-16-5	PCB-1232	1	0.099	0.099	0.0067	U
53469-21-9	PCB-1242	1	0.049	0.049	0.0093	U
12672-29-6	PCB-1248	1	0.049	0.049	0.0055	U
11097-69-1	PCB-1254	1	0.80	0.049	0.0090	
11096-82-5	PCB-1260	1	0.62	0.099	0.0066	
System Monitoring Compound		ADDED (mg/kg dry)	CONC (mg/kg dry)	% Rec.	QC Limits	Q
Decachlorobiphenyl		0.0498	0.0518	104	30 - 139	
Tetrachloro-m-xylene		0.0498	0.0418	84	32 - 129	

* Values outside of QC limits

080454

ANALYSIS DATA SHEET

40SS14

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-28 File ID: A166228-0

Sampled: 04/21/06 15:50 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 17:18

Solids: 67.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.099	0.099	0.0064	U
11104-28-2	PCB-1221	1	0.099	0.099	0.018	U
11141-16-5	PCB-1232	1	0.099	0.099	0.0067	U
53469-21-9	PCB-1242	1	0.049	0.049	0.0093	U
12672-29-6	PCB-1248	1	0.049	0.049	0.0055	U
11097-69-1	PCB-1254	1	0.055	0.049	0.0090	J, J
11096-82-5	PCB-1260	1	0.033	0.099	0.0066	J
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0498	0.0552	111	30 - 139	
Tetrachloro-m-xylene		0.0498	0.0435	87	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

40SS6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-29 File ID: A166229-0

Sampled: 04/21/06 15:55 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 17:36

Solids: 71.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.093	0.093	0.0061	U
11104-28-2	PCB-1221	1	0.093	0.093	0.017	U
11141-16-5	PCB-1232	1	0.093	0.093	0.0063	U
53469-21-9	PCB-1242	1	0.046	0.046	0.0087	U
12672-29-6	PCB-1248	1	0.046	0.046	0.0052	U
11097-69-1	PCB-1254	1	0.046	0.046	0.0085	U
11096-82-5	PCB-1260	1	0.093	0.093	0.0062	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0469	0.0479	102	30 - 139	
Tetrachloro-m-xylene		0.0469	0.0417	89	32 - 129	

* Values outside of QC limits

: 00484

ANALYSIS DATA SHEET

40SS18

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-30 File ID: A166230-0

Sampled: 04/21/06 16:00 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 17:54

Solids: 69.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.096	0.096	0.0062	U
11104-28-2	PCB-1221	1	0.096	0.096	0.018	U
11141-16-5	PCB-1232	1	0.096	0.096	0.0065	U
53469-21-9	PCB-1242	1	0.048	0.048	0.0090	U
12672-29-6	PCB-1248	1	0.048	0.048	0.0054	U
11097-69-1	PCB-1254	1	0.028	0.048	0.0087	J
11096-82-5	PCB-1260	1	0.096	0.096	0.0064	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0483	0.0457	95	30 - 139	
Tetrachloro-m-xylene		0.0483	0.0415	86	32 - 129	

* Values outside of QC limits

00435

ANALYSIS DATA SHEET

40SS10

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-31 File ID: A166231-0

Sampled: 04/21/06 16:20 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 18:12

Solids: 70.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.094	0.094	0.0061	U
11104-28-2	PCB-1221	1	0.094	0.094	0.017	U
11141-16-5	PCB-1232	1	0.094	0.094	0.0064	U
53469-21-9	PCB-1242	1	0.047	0.047	0.0089	U
12672-29-6	PCB-1248	1	0.047	0.047	0.0053	U
11097-69-1	PCB-1254	1	0.032	0.047	0.0086	J
11096-82-5	PCB-1260	1	0.094	0.094	0.0063	U
System Monitoring Compound		ADDED (mg/kg dry)	CONC (mg/kg dry)	% Rec.	QC Limits	Q
Decachlorobiphenyl		0.0476	0.0449	94	30 - 139	
Tetrachloro-m-xylene		0.0476	0.0414	87	32 - 129	

* Values outside of QC limits

: 000502

ANALYSIS DATA SHEET

40SS11

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-32 File ID: A166232-0

Sampled: 04/21/06 16:30 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 18:29

Solids: 68.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.097	0.097	0.0063	U
11104-28-2	PCB-1221	1	0.097	0.097	0.018	U
11141-16-5	PCB-1232	1	0.097	0.097	0.0066	U
53469-21-9	PCB-1242	1	0.049	0.049	0.0091	U
12672-29-6	PCB-1248	1	0.049	0.049	0.0054	U
11097-69-1	PCB-1254	1	0.047	0.049	0.0088	J
11096-82-5	PCB-1260	1	0.097	0.097	0.0065	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0490	0.0475	97	30 - 139	
Tetrachloro-m-xylene		0.0490	0.0433	88	32 - 129	

* Values outside of QC limits

: 06511

ANALYSIS DATA SHEET

Dup-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-33 File ID: A166233-0

Sampled: 04/21/06 00:00 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 18:47

Solids: 65.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.10	0.10	0.0066	U
11104-28-2	PCB-1221	1	0.10	0.10	0.019	U
11141-16-5	PCB-1232	1	0.10	0.10	0.0069	U
53469-21-9	PCB-1242	1	0.051	0.051	0.0095	U
12672-29-6	PCB-1248	1	0.051	0.051	0.0057	U
11097-69-1	PCB-1254	1	0.26	0.051	0.0092	
11096-82-5	PCB-1260	1	0.10	0.10	0.0068	U
System Monitoring Compound		ADDED (mg/kg dry)	CONC (mg/kg dry)	% Rec.	QC Limits	Q
Decachlorobiphenyl		0.0513	0.0500	97	30 - 139	
Tetrachloro-m-xylene		0.0513	0.0445	87	32 - 129	

* Values outside of QC limits

00526

ANALYSIS DATA SHEET

40SS12

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-34 File ID: A166234-0

Sampled: 04/21/06 16:45 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 19:05

Solids: 61.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.11	0.11	0.0070	U
11104-28-2	PCB-1221	1	0.11	0.11	0.020	U
11141-16-5	PCB-1232	1	0.11	0.11	0.0074	U
53469-21-9	PCB-1242	1	0.054	0.054	0.010	U
12672-29-6	PCB-1248	1	0.054	0.054	0.0061	U
11097-69-1	PCB-1254	1	0.038	0.054	0.0098	J
11096-82-5	PCB-1260	1	0.11	0.11	0.0072	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0546	0.0543	99	30 - 139	
Tetrachloro-m-xylene		0.0546	0.0481	88	32 - 129	

* Values outside of QC limits

: 00529

ANALYSIS DATA SHEET

40SS13

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Soil Laboratory ID: 0604436-35 File ID: B166235-0

Sampled: 04/21/06 16:50 Prepared: 04/28/06 09:11 Analyzed: 05/04/06 19:23

Solids: 66.00 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0604703 Sequence: 6050504 Calibration: 6E05001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.10	0.10	0.0065	U
11104-28-2	PCB-1221	1	0.10	0.10	0.018	U
11141-16-5	PCB-1232	1	0.10	0.10	0.0068	U
53469-21-9	PCB-1242	1	0.050	0.050	0.0094	U
12672-29-6	PCB-1248	1	0.050	0.050	0.0056	U
11097-69-1	PCB-1254	1	0.058	0.050	0.0091	
11096-82-5	PCB-1260	1	0.10	0.10	0.0067	U
System Monitoring Compound		**ADDED (mg/kg dry)**	**CONC (mg/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.0505	0.0530	105	30 - 139	
Tetrachloro-m-xylene		0.0505	0.0457	90	32 - 129	

* Values outside of QC limits

00536

ANALYSIS DATA SHEET

EQBK71

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71

Matrix: Water Laboratory ID: 0604436-36 File ID: A166060-0

Sampled: 04/21/06 12:20 Prepared: 04/26/06 08:53 Analyzed: 05/01/06 15:18

Solids: Preparation: 3510C Liquid-Liquid Initial/Final: 1040 mL / 2 mL

QC Batch: 0604627 Sequence: 6050252 Calibration: 6E02016 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.30	0.30	0.046	U
11104-28-2	PCB-1221	1	0.50	0.50	0.053	U
11141-16-5	PCB-1232	1	0.30	0.30	0.050	U
53469-21-9	PCB-1242	1	0.30	0.30	0.053	U
12672-29-6	PCB-1248	1	0.30	0.30	0.024	U
11097-69-1	PCB-1254	1	0.30	0.30	0.038	U
11096-82-5	PCB-1260	1	0.30	0.30	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.192	0.207	108	30 - 120	
Tetrachloro-m-xylene		0.192	0.148	77	36 - 114	

* Values outside of QC limits

00553

SAMPLE ID SUMMARY

USEPA-8015B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-28

Client: URS Group, Inc.

Project: RFAAP SWMUs 40 & 71 RFI/CMS

Client Sample Id:	Lab Sample Id:
71SB14A	0604436-01
71SB14B	0604436-02
71SB14C	0604436-03
71SB13A	0604436-04
71SB13B	0604436-05
71SB13C	0604436-06
Dup-2	0604436-07
71SS11B	0604436-08
71SS13B	0604436-09
71SB12A	0604436-10
71SB12B	0604436-11
71SB12C	0604436-12
71SS12B	0604436-13
71SB15A	0604436-14
71SB15B	0604436-15
71SB15C	0604436-16
71SB16A	0604436-17
71SB16B	0604436-18
71SB16C	0604436-19
Dup-3	0604436-20
EQBK71	0604436-36

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB14A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-01 File ID: B61_231

Sampled: 04/20/06 16:50 Prepared: 05/02/06 15:00 Analyzed: 05/03/06 02:36

Solids: 82.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051076 Calibration: 6E10017 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	6.1	6.1	0.95	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	46.6	93	82 - 107	

* Values outside of QC limits

01072

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB14B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-02 File ID: B61_232

Sampled: 04/20/06 16:55 Prepared: 05/02/06 15:00 Analyzed: 05/03/06 03:09

Solids: 77.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051076 Calibration: 6E10017 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	6.5	6.5	1.0	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	45.6	91	82 - 107	

* Values outside of QC limits

01076

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB14C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-03 File ID: B61_233

Sampled: 04/21/06 11:00 Prepared: 05/02/06 15:00 Analyzed: 05/03/06 03:43

Solids: 80.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051076 Calibration: 6E10017 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	13	6.2	0.98	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	45.7	91	82 - 107	

* Values outside of QC limits

01056

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB13A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-04 File ID: B61_234

Sampled: 04/20/06 15:50 Prepared: 05/02/06 15:00 Analyzed: 05/03/06 04:16

Solids: 82.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051076 Calibration: 6E10017 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	6.1	6.1	0.95	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	45.0	90	82 - 107	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB13B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-05 File ID: B61_235

Sampled: 04/20/06 16:15 Prepared: 05/02/06 15:00 Analyzed: 05/03/06 04:50

Solids: 73.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051076 Calibration: 6E10017 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	6.8	6.8	1.1	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	45.0	90	82 - 107	

* Values outside of QC limits

01088

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB13C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-06 File ID: B61_236

Sampled: 04/20/06 16:30 Prepared: 05/02/06 15:00 Analyzed: 05/03/06 05:23

Solids: 72.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051076 Calibration: 6E10017 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	6.9	6.9	1.1	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	44.4	89	82 - 107	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

Dup-2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-07 File ID: B61_237

Sampled: 04/20/06 00:00 Prepared: 05/02/06 15:00 Analyzed: 05/03/06 05:57

Solids: 70.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051076 Calibration: 6E10017 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	7.1	7.1	1.1	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	43.6	87	82 - 107	

* Values outside of QC limits

01056

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SS11B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-08 File ID: B61_238

Sampled: 04/20/06 18:00 Prepared: 05/02/06 15:00 Analyzed: 05/03/06 06:30

Solids: 68.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051076 Calibration: 6E10017 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	7.4	7.4	1.2	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	43.0	86	82 - 107	

* Values outside of QC limits

: 01106

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SS13B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-09 File ID: B61_239

Sampled: 04/20/06 19:15 Prepared: 05/02/06 15:00 Analyzed: 05/03/06 07:03

Solids: 73.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051076 Calibration: 6E10017 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	6.8	6.8	1.1	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	42.7	85	82 - 107	

* Values outside of QC limits

01104

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB12A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-10 File ID: B61_240

Sampled: 04/20/06 17:15 Prepared: 05/02/06 15:00 Analyzed: 05/03/06 07:36

Solids: 75.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051076 Calibration: 6E10017 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	6.7	6.7	1.0	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	42.4	85	82 - 107	

* Values outside of QC limits

01108

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB12B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-11 File ID: B61_268

Sampled: 04/20/06 17:30 Prepared: 05/03/06 15:00 Analyzed: 05/04/06 03:18

Solids: 67.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051077 Calibration: 6E11001 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	7.5	7.5	1.2	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	45.6	91	82 - 107	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB12C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-12 File ID: B61_269

Sampled: 04/20/06 17:45 Prepared: 05/03/06 15:00 Analyzed: 05/04/06 03:52

Solids: 68.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051077 Calibration: 6E11001 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	7.4	7.4	1.2	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	44.8	90	82 - 107	

* Values outside of QC limits

01116

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SS12B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-13 File ID: B61_270

Sampled: 04/20/06 13:30 Prepared: 05/03/06 15:00 Analyzed: 05/04/06 04:25

Solids: 68.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051077 Calibration: 6E11001 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	7.4	7.4	1.2	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	46.1	92	82 - 107	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB15A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-14 File ID: B61_271

Sampled: 04/21/06 10:15 Prepared: 05/03/06 15:00 Analyzed: 05/04/06 04:59

Solids: 84.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051077 Calibration: 6E11001 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	6.0	6.0	0.93	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	46.5	93	82 - 107	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB15B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-15 File ID: B61_272

Sampled: 04/21/06 10:30 Prepared: 05/03/06 15:00 Analyzed: 05/04/06 05:33

Solids: 76.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051077 Calibration: 6E11001 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	8.1	6.6	1.0	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	47.2	94	82 - 107	

* Values outside of QC limits

01128

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB15C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-16 File ID: B61_273

Sampled: 04/21/06 10:45 Prepared: 05/03/06 15:00 Analyzed: 05/04/06 06:06

Solids: 68.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051077 Calibration: 6E11001 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	9.7	7.4	1.2	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	45.6	91	82 - 107	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB16A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-17 File ID: B61_274

Sampled: 04/21/06 09:30 Prepared: 05/03/06 15:00 Analyzed: 05/04/06 06:40

Solids: 85.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051077 Calibration: 6E11001 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	5.9	5.9	0.92	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	49.2	98	82 - 107	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB16B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-18 File ID: B61_275

Sampled: 04/21/06 09:45 Prepared: 05/03/06 15:00 Analyzed: 05/04/06 07:14

Solids: 74.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051077 Calibration: 6E11001 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	6.8	6.8	1.1	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	48.5	97	82 - 107	

* Values outside of QC limits

01146

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB16C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-19 File ID: B61_279

Sampled: 04/21/06 10:00 Prepared: 05/03/06 15:00 Analyzed: 05/04/06 09:29

Solids: 65.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051077 Calibration: 6E11001 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	7.7	7.7	1.2	U

UJ, C

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	47.6	95	82 - 107	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

Dup-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-20 File ID: B61_280

Sampled: 04/21/06 00:00 Prepared: 05/03/06 15:00 Analyzed: 05/04/06 10:02

Solids: 86.00 Preparation: 5030B Aqueous Purge & Initial/Final: 10 g / 500 mL

QC Batch: 0605157 Sequence: 6051077 Calibration: 6E11001 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	GRO - 8015B (C6-C10)	1	5.8	5.8	0.91	U

UJ, C

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	46.1	92	82 - 107	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

EQBK71

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Water Laboratory ID: 0604436-36 File ID: B62_036

Sampled: 04/21/06 12:20 Prepared: 05/10/06 15:00 Analyzed: 05/10/06 22:45

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0605336 Sequence: 6051140 Calibration: 6E12014 Instrument: 140

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
	GRO - 8015B (C6-C10) VL/h	1	100	100	16	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
aaa-Trifluorotoluene	50.0	48.2	96	86 - 113	

* Values outside of QC limits

01152

SAMPLE ID SUMMARY

USEPA-8015B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Client Sample Id:	Lab Sample Id:
71SB14A	0604436-01
71SB14B	0604436-02
71SB14C	0604436-03
71SB13A	0604436-04
71SB13B	0604436-05
71SB13C	0604436-06
Dup-2	0604436-07
71SS11B	0604436-08
71SS13B	0604436-09
71SB12A	0604436-10
71SB12B	0604436-11
71SB12C	0604436-12
71SS12B	0604436-13
71SB15A	0604436-14
71SB15B	0604436-15
71SB15C	0604436-16
71SB16A	0604436-17
71SB16B	0604436-18
71SB16C	0604436-19
Dup-3	0604436-20
EQBK71	0604436-36

ORGANIC ANALYSIS DATA SHEET

· USEPA-8015B

71SB14A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-01 File ID: A9_504

Sampled: 04/20/06 16:50 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 09:00

Solids: 82.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050312 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	68	8.2	1.0	

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.63	1.53	94	44 - 137	

* Values outside of QC limits

61366

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB14B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-02 File ID: A9_505

Sampled: 04/20/06 16:55 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 09:36

Solids: 77.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050312 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	68	8.7	1.1	

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.73	1.64	95	44 - 137	

* Values outside of QC limits

01356

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB14C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-03 File ID: A9_506

Sampled: 04/21/06 11:00 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 10:13

Solids: 80.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050312 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	130	8.4	1.1	

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.67	1.40	84	44 - 137	

* Values outside of QC limits

01372

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB13A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-04 File ID: A9_507

Sampled: 04/20/06 15:50 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 10:50

Solids: 82.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050312 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	46	8.2	1.0	

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.63	1.32	81	44 - 137	

* Values outside of QC limits

: 01378

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB13B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-05 File ID: A9_517

Sampled: 04/20/06 16:15 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 18:55

Solids: 73.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	3.6	9.2	1.2	J

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.83	1.61	88	44 - 137	

* Values outside of QC limits

01385

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB13C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-06 File ID: A9_518

Sampled: 04/20/06 16:30 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 19:31

Solids: 72.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	2.4	9.3	1.2	J

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.85	1.68	91	44 - 137	

* Values outside of QC limits

01391

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

Dup-2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-07 File ID: A9_519

Sampled: 04/20/06 00:00 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 20:08

Solids: 70.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	3.4	9.6	1.2	J

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.90	1.70	89	44 - 137	

* Values outside of QC limits

01397

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SS11B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-08 File ID: A9_520

Sampled: 04/20/06 18:00 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 20:44

Solids: 68.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	3.9	9.9	1.2	J

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.96	1.82	93	44 - 137	

* Values outside of QC limits

01403

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SS13B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-09 File ID: A9_521

Sampled: 04/20/06 19:15 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 21:21

Solids: 73.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	3.2	9.2	1.2	J

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.83	1.54	84	44 - 137	

* Values outside of QC limits

: 01405

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB12A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-10 File ID: A9_522

Sampled: 04/20/06 17:15 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 21:57

Solids: 75.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	4.9	8.9	1.1	J

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.78	1.40	79	44 - 137	

* Values outside of QC limits

01415

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB12B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-11 File ID: A9_523

Sampled: 04/20/06 17:30 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 22:34

Solids: 67.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	3.0	10	1.3	J

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.99	1.67	84	44 - 137	

* Values outside of QC limits

01421

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB12C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-12 File ID: A9_524

Sampled: 04/20/06 17:45 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 23:11

Solids: 68.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	2.3	9.9	1.2	J

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.96	1.76	90	44 - 137	

* Values outside of QC limits

: 01427

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SS12B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-13 File ID: A9_525

Sampled: 04/20/06 13:30 Prepared: 05/01/06 07:39 Analyzed: 05/03/06 23:47

Solids: 68.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	3.0	9.9	1.2	J

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.96	1.74	89	44 - 137	

* Values outside of QC limits

01433

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB15A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-14 File ID: A9_526

Sampled: 04/21/06 10:15 Prepared: 05/01/06 07:39 Analyzed: 05/04/06 00:24

Solids: 84.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	21	8.0	1.0	

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.59	1.23	77	44 - 137	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB15B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-15 File ID: A9_528

Sampled: 04/21/06 10:30 Prepared: 05/01/06 07:39 Analyzed: 05/04/06 01:37

Solids: 76.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	140	8.8	1.1	

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.75	1.44	82	44 - 137	

* Values outside of QC limits

01445

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB15C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-16 File ID: A9__538

Sampled: 04/24/06 10:45 Prepared: 05/01/06 07:39 Analyzed: 05/04/06 08:14

Solids: 68.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	10	850	99	12	

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.96	2.34	119	44 - 137	D

* Values outside of QC limits

01452

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB16A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-17 File ID: A9_530

Sampled: 04/21/06 09:30 Prepared: 05/01/06 07:39 Analyzed: 05/04/06 02:50

Solids: 85.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	38	7.9	0.99	

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.57	1.28	82	44 - 137	

* Values outside of QC limits

01458

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB16B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-18 File ID: A9_531

Sampled: 04/21/06 09:45 Prepared: 05/01/06 07:39 Analyzed: 05/04/06 03:27

Solids: 74.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	9.7	9.1	1.1	

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.80	1.71	95	44 - 137	

* Values outside of QC limits

01464

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

71SB16C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-19 File ID: A9_540

Sampled: 04/21/06 10:00 Prepared: 05/01/06 07:39 Analyzed: 05/04/06 12:19

Solids: 65.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	9.4	10	1.3	J

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	2.05	1.76	86	44 - 137	

* Values outside of QC limits

01476

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

Dup-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil Laboratory ID: 0604436-20 File ID: A9_541

Sampled: 04/21/06 00:00 Prepared: 05/01/06 07:39 Analyzed: 05/04/06 12:55

Solids: 86.00 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0604810 Sequence: 6050426 Calibration: 6E03003 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (mg/kg dry)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	20	7.8	0.98	

System Monitoring Compound	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC.	QC Limits	Q
o-Terphenyl	1.55	1.13	73	44 - 137	

* Values outside of QC limits

01476

ORGANIC ANALYSIS DATA SHEET
USEPA-8015B

EQBK71

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28 4MD

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Water Laboratory ID: 0604436-36 File ID: A9__496

Sampled: 04/21/06 12:20 Prepared: 04/26/06 08:51 Analyzed: 05/03/06 04:07

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1050 mL / 1 mL

QC Batch: 0604626 Sequence: 6050330 Calibration: 6E03010 Instrument: 157

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
	DRO - 8015B (C10-C28)	1	200	200	79	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
o-Terphenyl	38.1	31.6	83	45 - 136	

* Values outside of QC limits

01482

SAMPLE ID SUMMARY

USEPA-6020

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS

Client Sample Id:	Lab Sample Id:
71SB14A	0604436-01
71SB14B	0604436-02
71SB14C	0604436-03
71SB13A	0604436-04
71SB13B	0604436-05
71SB13C	0604436-06
Dup-2	0604436-07
71SS11B	0604436-08
71SS13B	0604436-09
71SB12A	0604436-10
71SB12B	0604436-11
71SB12C	0604436-12
71SS12B	0604436-13
71SB15A	0604436-14
71SB15B	0604436-15
71SB15C	0604436-16
71SB16A	0604436-17
71SB16B	0604436-18
71SB16C	0604436-19
Dup-3	0604436-20
EQBK71	0604436-36

02264

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB14A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:50
Solids: 82.00
Laboratory ID: 0604436-01

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	55	mg/kg dry wt.	5	2.0	0.12		05/08/06 14:29	LM
7440-43-9	Cadmium, Total	0.30	mg/kg dry wt.	1	1.0	0.0073	J	05/05/06 12:01	
7440-50-8	Copper, Total	76	mg/kg dry wt.	5	5.0	0.11		05/08/06 14:29	LM
7439-92-1	Lead, Total	110	mg/kg dry wt.	5	5.0	0.21		05/08/06 14:29	
7440-02-0	Nickel, Total	13	mg/kg dry wt.	1	0.50	0.027		05/05/06 12:01	JS
7782-49-2	Selenium, Total	2.9	mg/kg dry wt.	1	1.0	0.063		05/05/06 12:01	LM
7440-22-4	Silver, Total	0.16	mg/kg dry wt.	1	3.0	0.017	J	05/05/06 12:01	
7440-28-0	Thallium, Total	1.3	mg/kg dry wt.	1	0.50	0.0085		05/05/06 12:01	
7440-62-2	Vanadium, Total	26	mg/kg dry wt.	1	1.0	0.024		05/08/06 15:29	JS

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB14A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:50
Solids: 82.00
Laboratory ID: 0604436-01

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Total	1.3	mg/kg dry wt.	1	0.50	0.036		05/02/06 16:05	B, P

62206

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB14B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:55
Solids: 77.00
Laboratory ID: 0604436-02

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.5 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	2.8	mg/kg dry wt.	1	0.40	0.023		05/05/06 12:04	L,M
7440-43-9	Cadmium, Total	0.38	mg/kg dry wt.	1	1.0	0.0073	J	05/05/06 12:04	
7440-50-8	Copper, Total	36	mg/kg dry wt.	1	1.0	0.022		05/05/06 12:04	L,M
7439-92-1	Lead, Total	41	mg/kg dry wt.	1	1.0	0.041		05/05/06 12:04	
7440-02-0	Nickel, Total	10	mg/kg dry wt.	1	0.50	0.027		05/05/06 12:04	J,S
7782-49-2	Selenium, Total	0.12	mg/kg dry wt.	1	1.0	0.063	J	05/05/06 12:04	L,M
7440-22-4	Silver, Total	0.19	mg/kg dry wt.	1	3.0	0.017	J	05/05/06 12:04	
7440-28-0	Thallium, Total	0.26	mg/kg dry wt.	1	0.50	0.0085	J	05/05/06 12:04	
7440-62-2	Vanadium, Total	60	mg/kg dry wt.	2	2.0	0.047		05/08/06 15:31	J,S

62207

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB14B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:55
Solids: 77.00
Laboratory ID: 0604436-02

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Total	0.31	mg/kg dry wt.	1	0.50	0.036	J	05/02/06 16:11	B,P

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB14C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 11:00
Solids: 80.00
Laboratory ID: 0604436-03

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	14	mg/kg dry wt.	1	0.40	0.023		05/05/06 12:07	L1M
7440-43-9	Cadmium, Total	0.13	mg/kg dry wt.	1	1.0	0.0073	J	05/05/06 12:07	
7440-50-8	Copper, Total	25	mg/kg dry wt.	1	1.0	0.022		05/05/06 12:07	L1M
7439-92-1	Lead, Total	39	mg/kg dry wt.	1	1.0	0.041		05/05/06 12:07	
7440-02-0	Nickel, Total	15	mg/kg dry wt.	1	0.50	0.027		05/05/06 12:07	J,S
7782-49-2	Selenium, Total	0.78	mg/kg dry wt.	1	1.0	0.063	J	05/05/06 12:07	L1M
7440-22-4	Silver, Total	0.10	mg/kg dry wt.	1	3.0	0.017	J	05/05/06 12:07	
7440-28-0	Thallium, Total	0.41	mg/kg dry wt.	1	0.50	0.0085	J	05/05/06 12:07	
7440-62-2	Vanadium, Total	28	mg/kg dry wt.	1	1.0	0.024		05/08/06 15:33	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB14C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 11:00
Solids: 80.00
Laboratory ID: 0604436-03

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.57	mg/kg dry wt.	1	0.50	0.036		05/02/06 16:13

B P

02216

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 15:50
Solids: 82.00
Laboratory ID: 0604436-04

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	16	mg/kg dry wt.	1	0.40	0.023		05/11/06 10:48	LM
7440-43-9	Cadmium, Total	0.17	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 10:48	
7440-50-8	Copper, Total	26	mg/kg dry wt.	1	1.0	0.022		05/11/06 10:48	LM
7439-92-1	Lead, Total	45	mg/kg dry wt.	1	1.0	0.041		05/11/06 10:48	
7440-02-0	Nickel, Total	13	mg/kg dry wt.	1	0.50	0.027		05/11/06 10:48	JS
7782-49-2	Selenium, Total	0.60	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 10:48	LM
7440-22-4	Silver, Total	0.12	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 10:48	
7440-28-0	Thallium, Total	0.59	mg/kg dry wt.	1	0.50	0.0085		05/11/06 10:48	
7440-62-2	Vanadium, Total	20	mg/kg dry wt.	1	1.0	0.024		05/11/06 10:48	JS

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 15:50
Solids: 82.00
Laboratory ID: 0604436-04

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.53	mg/kg dry wt.	1	0.50	0.036		05/02/06 16:15

B1P

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB13B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:15
Solids: 73.00
Laboratory ID: 0604436-05

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.5 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	0.32	mg/kg dry wt.	1	0.40	0.023	J	05/11/06 10:51	B,P
7440-43-9	Cadmium, Total	0.024	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 10:51	
7440-50-8	Copper, Total	6.4	mg/kg dry wt.	1	1.0	0.022		05/11/06 10:51	L,M
7439-92-1	Lead, Total	1.3	mg/kg dry wt.	1	1.0	0.041		05/11/06 10:51	
7440-02-0	Nickel, Total	31	mg/kg dry wt.	1	0.50	0.027		05/11/06 10:51	J,S
7782-49-2	Selenium, Total	0.15	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 10:51	L,M
7440-22-4	Silver, Total	0.13	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 10:51	
7440-28-0	Thallium, Total	0.19	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 10:51	
7440-62-2	Vanadium, Total	65	mg/kg dry wt.	2	2.0	0.047		05/11/06 12:38	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB13B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:15
Solids: 73.00
Laboratory ID: 0604436-05

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.50	mg/kg dry wt.	1	0.50	0.036	U	05/02/06 16:17

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB13C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:30
Solids: 72.00
Laboratory ID: 0604436-06

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	1.3	mg/kg dry wt.	1	0.40	0.023		05/11/06 10:55	B,P
7440-43-9	Cadmium, Total	0.025	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 10:55	
7440-50-8	Copper, Total	18	mg/kg dry wt.	1	1.0	0.022		05/11/06 10:55	L,M
7439-92-1	Lead, Total	7.1	mg/kg dry wt.	1	1.0	0.041		05/11/06 10:55	
7440-02-0	Nickel, Total	38	mg/kg dry wt.	1	0.50	0.027		05/11/06 10:55	J,S
7782-49-2	Selenium, Total	0.30	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 10:55	L,M
7440-22-4	Silver, Total	0.13	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 10:55	
7440-28-0	Thallium, Total	0.26	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 10:55	
7440-62-2	Vanadium, Total	85	mg/kg dry wt.	2	2.0	0.047		05/11/06 12:40	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB13C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:30
Solids: 72.00
Laboratory ID: 0604436-06

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.069	mg/kg dry wt.	1	0.50	0.036	J	05/02/06 16:19

P, P

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

Dup-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 00:00
Solids: 70.00
Laboratory ID: 0604436-07

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	2.3	mg/kg dry wt.	1	0.40	0.023		05/11/06 10:58	L,M
7440-43-9	Cadmium, Total	0.035	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 10:58	
7440-50-8	Copper, Total	23	mg/kg dry wt.	1	1.0	0.022		05/11/06 10:58	L,M
7439-92-1	Lead, Total	8.8	mg/kg dry wt.	1	1.0	0.041		05/11/06 10:58	
7440-02-0	Nickel, Total	35	mg/kg dry wt.	1	0.50	0.027		05/11/06 10:58	J,S
7782-49-2	Selenium, Total	0.44	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 10:58	L,M
7440-22-4	Silver, Total	0.19	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 10:58	
7440-28-0	Thallium, Total	0.28	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 10:58	
7440-62-2	Vanadium, Total	89	mg/kg dry wt.	2	2.0	0.047		05/11/06 12:42	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

Dup-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 00:00
Solids: 70.00
Laboratory ID: 0604436-07

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.11	mg/kg dry wt.	1	0.50	0.036	J	05/02/06 16:21

B1P

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SS11B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 18:00
Solids: 68.00
Laboratory ID: 0604436-08

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	3.0	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:01	L1M
7440-43-9	Cadmium, Total	0.041	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 11:01	
7440-50-8	Copper, Total	26	mg/kg dry wt.	1	1.0	0.022		05/11/06 11:01	L1M
7439-92-1	Lead, Total	11	mg/kg dry wt.	1	1.0	0.041		05/11/06 11:01	
7440-02-0	Nickel, Total	40	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:01	J,S
7782-49-2	Selenium, Total	0.49	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:01	L1M
7440-22-4	Silver, Total	0.21	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:01	
7440-28-0	Thallium, Total	0.38	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:01	
7440-62-2	Vanadium, Total	110	mg/kg dry wt.	5	5.0	0.12		05/11/06 12:44	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SS11B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 18:00
Solids: 68.00
Laboratory ID: 0604436-08

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.11	mg/kg dry wt.	1	0.50	0.036	J	05/02/06 16:23

B,P

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SS13B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 19:15
Solids: 73.00
Laboratory ID: 0604436-09

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	3.1	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:04	L,M
7440-43-9	Cadmium, Total	0.029	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 11:04	
7440-50-8	Copper, Total	20	mg/kg dry wt.	1	1.0	0.022		05/11/06 11:04	L,M
7439-92-1	Lead, Total	11	mg/kg dry wt.	1	1.0	0.041		05/11/06 11:04	
7440-02-0	Nickel, Total	37	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:04	J,S
7782-49-2	Selenium, Total	0.32	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:04	L,M
7440-22-4	Silver, Total	0.17	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:04	
7440-28-0	Thallium, Total	0.34	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:04	
7440-62-2	Vanadium, Total	94	mg/kg dry wt.	2	2.0	0.047		05/11/06 12:46	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SS13B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 19:15
Solids: 73.00
Laboratory ID: 0604436-09

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.11	mg/kg dry wt.	1	0.50	0.036	J	05/02/06 16:25

B, P

82222

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB12A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:15
Solids: 75.00
Laboratory ID: 0604436-10

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	5.0	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:08	LIM
7440-43-9	Cadmium, Total	0.057	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 11:08	
7440-50-8	Copper, Total	26	mg/kg dry wt.	1	1.0	0.022		05/11/06 11:08	LIM
7439-92-1	Lead, Total	24	mg/kg dry wt.	1	1.0	0.041		05/11/06 11:08	
7440-02-0	Nickel, Total	33	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:08	J,S
7782-49-2	Selenium, Total	0.25	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:08	LIM
7440-22-4	Silver, Total	0.15	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:08	
7440-28-0	Thallium, Total	0.39	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:08	
7440-62-2	Vanadium, Total	91	mg/kg dry wt.	2	2.0	0.047		05/11/06 12:48	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB12A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:15
Solids: 75.00
Laboratory ID: 0604436-10

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Total	0.25	mg/kg dry wt.	1	0.50	0.036	J	05/02/06 16:27	B,P

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB12B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:30
Solids: 67.00
Laboratory ID: 0604436-11

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	4.5	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:11	L,M
7440-43-9	Cadmium, Total	0.063	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 11:11	
7440-50-8	Copper, Total	31	mg/kg dry wt.	1	1.0	0.022		05/11/06 11:11	L,M
7439-92-1	Lead, Total	17	mg/kg dry wt.	1	1.0	0.041		05/11/06 11:11	
7440-02-0	Nickel, Total	46	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:11	J,S
7782-49-2	Selenium, Total	0.60	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:11	L,M
7440-22-4	Silver, Total	0.15	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:11	
7440-28-0	Thallium, Total	0.43	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:11	
7440-62-2	Vanadium, Total	130	mg/kg dry wt.	5	5.0	0.12		05/11/06 12:50	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB12B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:30
Solids: 67.00
Laboratory ID: 0604436-11

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.24	mg/kg dry wt.	1	0.50	0.036	J	05/02/06 16:29

B,P

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB12C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:45
Solids: 68.00
Laboratory ID: 0604436-12

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	1.1	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:14	B,P
7440-43-9	Cadmium, Total	0.017	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 11:14	
7440-50-8	Copper, Total	20	mg/kg dry wt.	1	1.0	0.022		05/11/06 11:14	L,M
7439-92-1	Lead, Total	5.8	mg/kg dry wt.	1	1.0	0.041		05/11/06 11:14	
7440-02-0	Nickel, Total	31	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:14	J,S
7782-49-2	Selenium, Total	0.18	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:14	L,M
7440-22-4	Silver, Total	0.19	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:14	
7440-28-0	Thallium, Total	0.22	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:14	
7440-62-2	Vanadium, Total	68	mg/kg dry wt.	2	2.0	0.047		05/11/06 12:52	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB12C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:45
Solids: 68.00
Laboratory ID: 0604436-12

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.50	mg/kg dry wt.	1	0.50	0.036	U	05/02/06 16:35

02228

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SS12B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 13:30
Solids: 68.00
Laboratory ID: 0604436-13

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	1.1	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:18	B,P
7440-43-9	Cadmium, Total	0.033	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 11:18	
7440-50-8	Copper, Total	29	mg/kg dry wt.	1	1.0	0.022		05/11/06 11:18	L,M
7439-92-1	Lead, Total	5.9	mg/kg dry wt.	1	1.0	0.041		05/11/06 11:18	
7440-02-0	Nickel, Total	32	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:18	J,S
7782-49-2	Selenium, Total	0.29	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:18	L,M
7440-22-4	Silver, Total	0.19	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:18	
7440-28-0	Thallium, Total	0.21	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:18	
7440-62-2	Vanadium, Total	67	mg/kg dry wt.	2	2.0	0.047		05/12/06 16:14	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SS12B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 13:30
Solids: 68.00
Laboratory ID: 0604436-13

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.50	mg/kg dry wt.	1	0.50	0.036	U	05/02/06 16:36

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB15A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:15
Solids: 84.00
Laboratory ID: 0604436-14

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	0.068	mg/kg dry wt.	1	0.40	0.023	J	05/11/06 11:40	B,P
7440-43-9	Cadmium, Total	0.42	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 11:40	
7440-50-8	Copper, Total	24	mg/kg dry wt.	1	1.0	0.022		05/11/06 11:40	L,M
7439-92-1	Lead, Total	8.0	mg/kg dry wt.	1	1.0	0.041		05/11/06 11:40	J,F
7440-02-0	Nickel, Total	19	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:40	J,S
7782-49-2	Selenium, Total	0.24	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:40	L,M
7440-22-4	Silver, Total	0.022	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:40	
7440-28-0	Thallium, Total	0.44	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:40	
7440-62-2	Vanadium, Total	1.0	mg/kg dry wt.	1	1.0	0.024	U	05/11/06 11:40	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB15A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:15
Solids: 84.00
Laboratory ID: 0604436-14

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.88	mg/kg dry wt.	1	0.50	0.036		05/02/06 16:46

B P

02232

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB15B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:30
Solids: 76.00
Laboratory ID: 0604436-15

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	7.5	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:44	L,M
7440-43-9	Cadmium, Total	7.6	mg/kg dry wt.	1	1.0	0.0073		05/11/06 11:44	
7440-50-8	Copper, Total	500	mg/kg dry wt.	20	20	0.45		05/11/06 13:08	L,M
7439-92-1	Lead, Total	55	mg/kg dry wt.	2	2.0	0.083		05/11/06 13:10	
7440-02-0	Nickel, Total	33	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:44	J,S
7782-49-2	Selenium, Total	0.48	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:44	L,M
7440-22-4	Silver, Total	0.24	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:44	
7440-28-0	Thallium, Total	0.34	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:44	
7440-62-2	Vanadium, Total	33	mg/kg dry wt.	1	1.0	0.024		05/11/06 11:44	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB15B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:30
Solids: 76.00
Laboratory ID: 0604436-15

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	4.5	mg/kg dry wt.	1	0.50	0.036		05/02/06 16:48

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB15C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:45
Solids: 68.00
Laboratory ID: 0604436-16

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	19	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:47	L1 M1
7440-43-9	Cadmium, Total	2.8	mg/kg dry wt.	1	1.0	0.0073		05/11/06 11:47	
7440-50-8	Copper, Total	52000	mg/kg dry wt.	2000	2000	45		05/11/06 13:29	L1 M1
7439-92-1	Lead, Total	1100	mg/kg dry wt.	40	40	1.7		05/11/06 13:14	
7440-02-0	Nickel, Total	20	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:47	J, S
7782-49-2	Selenium, Total	0.55	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:47	L1 M1
7440-22-4	Silver, Total	2.7	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:47	
7440-28-0	Thallium, Total	0.27	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:47	
7440-62-2	Vanadium, Total	23	mg/kg dry wt.	1	1.0	0.024		05/11/06 11:47	J, S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB15C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:45
Solids: 68.00
Laboratory ID: 0604436-16

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	6.1	mg/kg dry wt.	1	0.50	0.036		05/02/06 16:50

62236

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB16A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 09:30
Solids: 85.00
Laboratory ID: 0604436-17

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	15	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:50	L,M
7440-43-9	Cadmium, Total	0.23	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 11:50	
7440-50-8	Copper, Total	40	mg/kg dry wt.	1	1.0	0.022		05/11/06 11:50	L,M
7439-92-1	Lead, Total	67	mg/kg dry wt.	2	2.0	0.083		05/11/06 13:16	
7440-02-0	Nickel, Total	16	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:50	J,S
7782-49-2	Selenium, Total	0.63	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:50	L,M
7440-22-4	Silver, Total	0.14	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:50	
7440-28-0	Thallium, Total	0.35	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:50	
7440-62-2	Vanadium, Total	29	mg/kg dry wt.	1	1.0	0.024		05/11/06 11:50	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB16A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 09:30
Solids: 85.00
Laboratory ID: 0604436-17

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	1.5	mg/kg dry wt.	1	0.50	0.036		05/02/06 16:52

B1P

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB16B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 09:45
Solids: 74.00
Laboratory ID: 0604436-18

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	3.5	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:53	L,M
7440-43-9	Cadmium, Total	0.017	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 11:53	
7440-50-8	Copper, Total	17	mg/kg dry wt.	1	1.0	0.022		05/11/06 11:53	L,M
7439-92-1	Lead, Total	18	mg/kg dry wt.	1	1.0	0.041		05/11/06 11:53	
7440-02-0	Nickel, Total	23	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:53	J,S
7782-49-2	Selenium, Total	0.30	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:53	L,M
7440-22-4	Silver, Total	0.11	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:53	
7440-28-0	Thallium, Total	0.34	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:53	
7440-62-2	Vanadium, Total	72	mg/kg dry wt.	2	2.0	0.047		05/11/06 13:18	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB16B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 09:45
Solids: 74.00
Laboratory ID: 0604436-18

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.061	mg/kg dry wt.	1	0.50	0.036	J	05/02/06 16:58

BP

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:00
Solids: 65.00
Laboratory ID: 0604436-19

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	4.6	mg/kg dry wt.	1	0.40	0.023		05/11/06 11:57	LM
7440-43-9	Cadmium, Total	0.036	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 11:57	
7440-50-8	Copper, Total	32	mg/kg dry wt.	1	1.0	0.022		05/11/06 11:57	LM
7439-92-1	Lead, Total	22	mg/kg dry wt.	1	1.0	0.041		05/11/06 11:57	
7440-02-0	Nickel, Total	37	mg/kg dry wt.	1	0.50	0.027		05/11/06 11:57	J,S
7782-49-2	Selenium, Total	0.33	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 11:57	LM
7440-22-4	Silver, Total	0.19	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 11:57	
7440-28-0	Thallium, Total	0.25	mg/kg dry wt.	1	0.50	0.0085	J	05/11/06 11:57	
7440-62-2	Vanadium, Total	96	mg/kg dry wt.	5	5.0	0.12		05/11/06 13:24	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

71SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:00
Solids: 65.00
Laboratory ID: 0604436-19

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Total	0.11	mg/kg dry wt.	1	0.50	0.036	J	05/02/06 17:00	B,P

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

Dup-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 00:00
Solids: 86.00
Laboratory ID: 0604436-20

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:03
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0604727

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	15	mg/kg dry wt.	1	0.40	0.023		05/11/06 12:26	L1M
7440-43-9	Cadmium, Total	0.30	mg/kg dry wt.	1	1.0	0.0073	J	05/11/06 12:26	
7440-50-8	Copper, Total	67	mg/kg dry wt.	2	2.0	0.045		05/11/06 13:26	L1M
7439-92-1	Lead, Total	31	mg/kg dry wt.	1	1.0	0.041		05/11/06 13:26	J,(
7440-02-0	Nickel, Total	19	mg/kg dry wt.	1	0.50	0.027		05/11/06 12:26	J,S
7782-49-2	Selenium, Total	0.71	mg/kg dry wt.	1	1.0	0.063	J	05/11/06 12:26	L1M
7440-22-4	Silver, Total	0.12	mg/kg dry wt.	1	3.0	0.017	J	05/11/06 12:26	
7440-28-0	Thallium, Total	0.54	mg/kg dry wt.	1	0.50	0.0085		05/11/06 12:26	
7440-62-2	Vanadium, Total	37	mg/kg dry wt.	1	1.0	0.024		05/11/06 12:26	J,S

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

Dup-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 00:00
Solids: 86.00
Laboratory ID: 0604436-20

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 05/01/06 14:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0604758

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Total	1.4	mg/kg dry wt.	1	0.50	0.036		05/02/06 17:02	B,P

INORGANIC ANALYSIS DATA SHEET
USEPA-6020

EQBK71

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Water
Sampled: 04/21/06 12:20
Solids: 0.00
Laboratory ID: 0604436-36

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3010A Digestion
Prepared: 05/02/06 06:20
Initial/Final: 25 mL / 25 mL
QC Batch: 0604826

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	3.0	ug/L	1	3.0	0.73	U	05/05/06 09:40
7440-38-2	Arsenic, Total	2.0	ug/L	1	2.0	0.47	U	05/05/06 09:40
7440-43-9	Cadmium, Total	0.50	ug/L	1	0.50	0.062	U	05/05/06 09:40
7440-48-4	Cobalt, Total	10	ug/L	1	10	0.22	U	05/05/06 09:40
7440-50-8	Copper, Total	3.0	ug/L	1	3.0	0.32	U	05/05/06 09:40
7439-92-1	Lead, Total	1.0	ug/L	1	1.0	0.22	U	05/05/06 09:40
7439-96-5	Manganese, Total	10	ug/L	1	10	0.74	U	05/05/06 09:40
7440-02-0	Nickel, Total	3.0	ug/L	1	3.0	0.80	U	05/05/06 09:40
7782-49-2	Selenium, Total	3.0	ug/L	1	3.0	0.73	U	05/05/06 09:40
7440-22-4	Silver, Total	0.50	ug/L	1	0.50	0.073	U	05/05/06 09:40
7440-28-0	Thallium, Total	1.0	ug/L	1	1.0	0.14	U	05/05/06 09:40
7440-62-2	Vanadium, Total	10	ug/L	1	10	0.26	U	05/05/06 09:40

: 02245

SAMPLE ID SUMMARY

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-28

Client: URS Group, Inc.

Project: RFAAP SWMUs 40 & 71 RFI/CMS

Client Sample Id:	Lab Sample Id:
71SB14A	0604436-01
71SB14B	0604436-02
71SB14C	0604436-03
71SB13A	0604436-04
71SB13B	0604436-05
71SB13C	0604436-06
Dup-2	0604436-07
71SS11B	0604436-08
71SS13B	0604436-09
71SB12A	0604436-10
71SB12B	0604436-11
71SB12C	0604436-12
71SS12B	0604436-13
71SB15A	0604436-14
71SB15B	0604436-15
71SB15C	0604436-16
71SB16A	0604436-17
71SB16B	0604436-18
71SB16C	0604436-19
Dup-3	0604436-20
EQBK71	0604436-36

01665

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB14A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:50
Solids: 82.00
Laboratory ID: 0604436-01

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	8500	mg/kg dry wt.	1	50	1.6		05/08/06 12:01	
7440-39-3	Barium, Total	140	mg/kg dry wt.	1	5.0	0.10		05/08/06 12:01	
7440-41-7	Beryllium, Total	0.91	mg/kg dry wt.	1	1.0	0.016	J	05/08/06 12:01	
7440-70-2	Calcium, Total	3200	mg/kg dry wt.	1	250	10		05/08/06 12:01	L,M
7440-47-3	Chromium, Total	28	mg/kg dry wt.	1	5.0	0.57		05/08/06 12:01	L,M
7440-48-4	Cobalt, Total	6.1	mg/kg dry wt.	1	1.0	0.35		05/08/06 12:01	L,M
7439-89-6	Iron, Total	27000	mg/kg dry wt.	50	500	23		05/09/06 12:14	
7439-95-4	Magnesium, Total	1700	mg/kg dry wt.	1	250	3.4		05/08/06 12:01	
7439-96-5	Manganese, Total	210	mg/kg dry wt.	1	10	0.14		05/08/06 12:01	
7440-09-7	Potassium, Total	1600	mg/kg dry wt.	1	100	7.5		05/08/06 12:01	
7440-23-5	Sodium, Total	370	mg/kg dry wt.	1	100	19		05/08/06 12:01	L,M
7440-66-6	Zinc, Total	100	mg/kg dry wt.	2	8.0	1.7		05/09/06 15:57	L,M

01565

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB14B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:55
Solids: 77.00
Laboratory ID: 0604436-02

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	24000	mg/kg dry wt.	1	50	1.6		05/08/06 12:05	
7440-39-3	Barium, Total	65	mg/kg dry wt.	1	5.0	0.10		05/08/06 12:05	
7440-41-7	Beryllium, Total	0.43	mg/kg dry wt.	1	1.0	0.016	J	05/08/06 12:05	
7440-70-2	Calcium, Total	4300	mg/kg dry wt.	1	250	10		05/08/06 12:05	L,M
7440-47-3	Chromium, Total	38	mg/kg dry wt.	1	5.0	0.57		05/08/06 12:05	L,M
7440-48-4	Cobalt, Total	6.8	mg/kg dry wt.	1	1.0	0.35		05/08/06 12:05	L,M
7439-89-6	Iron, Total	30000	mg/kg dry wt.	50	500	23		05/09/06 12:18	
7439-95-4	Magnesium, Total	1400	mg/kg dry wt.	1	250	3.4		05/08/06 12:05	
7439-96-5	Manganese, Total	380	mg/kg dry wt.	1	10	0.14		05/08/06 12:05	
7440-09-7	Potassium, Total	1100	mg/kg dry wt.	1	100	7.5		05/08/06 12:05	
7440-23-5	Sodium, Total	180	mg/kg dry wt.	1	100	19		05/08/06 12:05	L,M
7440-66-6	Zinc, Total	120	mg/kg dry wt.	2	8.0	1.7		05/09/06 16:01	L,M

01657

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB14C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 11:00
Solids: 80.00
Laboratory ID: 0604436-03

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	11000	mg/kg dry wt.	1	50	1.6		05/08/06 12:10	
7440-39-3	Barium, Total	79	mg/kg dry wt.	1	5.0	0.10		05/08/06 12:10	
7440-41-7	Beryllium, Total	0.73	mg/kg dry wt.	1	1.0	0.016	J	05/08/06 12:10	
7440-70-2	Calcium, Total	3600	mg/kg dry wt.	1	250	10		05/08/06 12:10	L,M
7440-47-3	Chromium, Total	24	mg/kg dry wt.	1	5.0	0.57		05/08/06 12:10	L,M
7440-48-4	Cobalt, Total	8.9	mg/kg dry wt.	1	1.0	0.35		05/08/06 12:10	L,M
7439-89-6	Iron, Total	20000	mg/kg dry wt.	50	500	23		05/09/06 12:22	
7439-95-4	Magnesium, Total	3200	mg/kg dry wt.	1	250	3.4		05/08/06 12:10	
7439-96-5	Manganese, Total	410	mg/kg dry wt.	1	10	0.14		05/08/06 12:10	
7440-09-7	Potassium, Total	1100	mg/kg dry wt.	1	100	7.5		05/08/06 12:10	
7440-23-5	Sodium, Total	620	mg/kg dry wt.	1	100	19		05/08/06 12:10	L,M
7440-66-6	Zinc, Total	51	mg/kg dry wt.	1	4.0	0.85		05/08/06 12:10	L,M

: 01555

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 15:50
Solids: 82.00
Laboratory ID: 0604436-04

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	7800	mg/kg dry wt.	1	50	1.6		05/08/06 12:31	
7440-39-3	Barium, Total	120	mg/kg dry wt.	1	5.0	0.10		05/08/06 12:31	
7440-41-7	Beryllium, Total	0.86	mg/kg dry wt.	1	1.0	0.016	J	05/08/06 12:31	
7440-70-2	Calcium, Total	18000	mg/kg dry wt.	1	250	10		05/08/06 12:31	L,M
7440-47-3	Chromium, Total	26	mg/kg dry wt.	1	5.0	0.57		05/08/06 12:31	L,M
7440-48-4	Cobalt, Total	4.6	mg/kg dry wt.	1	1.0	0.35		05/08/06 12:31	L,M
7439-89-6	Iron, Total	9400	mg/kg dry wt.	25	250	11		05/09/06 12:26	
7439-95-4	Magnesium, Total	12000	mg/kg dry wt.	1	250	3.4		05/08/06 12:31	
7439-96-5	Manganese, Total	130	mg/kg dry wt.	1	10	0.14		05/08/06 12:31	
7440-09-7	Potassium, Total	1400	mg/kg dry wt.	1	100	7.5		05/08/06 12:31	
7440-23-5	Sodium, Total	170	mg/kg dry wt.	1	100	19		05/08/06 12:31	L,M
7440-66-6	Zinc, Total	45	mg/kg dry wt.	1	4.0	0.85		05/08/06 12:31	L,M

01665

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB13B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:15
Solids: 73.00
Laboratory ID: 0604436-05

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	42000	mg/kg dry wt.	25	1200	40		05/09/06 12:35	
7440-39-3	Barium, Total	79	mg/kg dry wt.	1	5.0	0.10		05/08/06 12:36	
7440-41-7	Beryllium, Total	1.5	mg/kg dry wt.	1	1.0	0.016		05/08/06 12:36	
7440-70-2	Calcium, Total	6200	mg/kg dry wt.	1	250	10		05/08/06 12:36	L,M
7440-47-3	Chromium, Total	55	mg/kg dry wt.	1	5.0	0.57		05/08/06 12:36	L,M
7440-48-4	Cobalt, Total	7.6	mg/kg dry wt.	1	1.0	0.35		05/08/06 12:36	L,M
7439-89-6	Iron, Total	46000	mg/kg dry wt.	100	1000	46		05/09/06 12:31	
7439-95-4	Magnesium, Total	55000	mg/kg dry wt.	25	6200	86		05/09/06 12:35	
7439-96-5	Manganese, Total	280	mg/kg dry wt.	1	10	0.14		05/08/06 12:36	
7440-09-7	Potassium, Total	6900	mg/kg dry wt.	1	100	7.5		05/08/06 12:36	
7440-23-5	Sodium, Total	50	mg/kg dry wt.	1	100	19	J	05/08/06 12:36	L,M
7440-66-6	Zinc, Total	59	mg/kg dry wt.	1	4.0	0.85		05/08/06 12:36	L,M

091676

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB13C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:30
Solids: 72.00
Laboratory ID: 0604436-06

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	50000	mg/kg dry wt.	25	1200	40		05/09/06 12:43	
7440-39-3	Barium, Total	99	mg/kg dry wt.	1	5.0	0.10		05/08/06 12:41	
7440-41-7	Beryllium, Total	2.5	mg/kg dry wt.	1	1.0	0.016		05/08/06 12:41	
7440-70-2	Calcium, Total	1900	mg/kg dry wt.	1	250	10		05/08/06 12:41	L,M
7440-47-3	Chromium, Total	66	mg/kg dry wt.	1	5.0	0.57		05/08/06 12:41	L,M
7440-48-4	Cobalt, Total	10	mg/kg dry wt.	1	1.0	0.35		05/08/06 12:41	L,M
7439-89-6	Iron, Total	54000	mg/kg dry wt.	100	1000	46		05/09/06 12:39	
7439-95-4	Magnesium, Total	35000	mg/kg dry wt.	25	6200	86		05/09/06 12:43	
7439-96-5	Manganese, Total	420	mg/kg dry wt.	1	10	0.14		05/08/06 12:41	
7440-09-7	Potassium, Total	4700	mg/kg dry wt.	1	100	7.5		05/08/06 12:41	
7440-23-5	Sodium, Total	220	mg/kg dry wt.	1	100	19		05/08/06 12:41	L,M
7440-66-6	Zinc, Total	67	mg/kg dry wt.	1	4.0	0.85		05/08/06 12:41	L,M

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

Dup-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 00:00
Solids: 70.00
Laboratory ID: 0604436-07

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	43000	mg/kg dry wt.	25	1200	40		05/09/06 12:51	
7440-39-3	Barium, Total	100	mg/kg dry wt.	1	5.0	0.10		05/08/06 12:45	
7440-41-7	Beryllium, Total	2.3	mg/kg dry wt.	1	1.0	0.016		05/08/06 12:45	
7440-70-2	Calcium, Total	2400	mg/kg dry wt.	1	250	10		05/08/06 12:45	L,M
7440-47-3	Chromium, Total	54	mg/kg dry wt.	1	5.0	0.57		05/08/06 12:45	L,M
7440-48-4	Cobalt, Total	7.5	mg/kg dry wt.	1	1.0	0.35		05/08/06 12:45	L,M
7439-89-6	Iron, Total	50000	mg/kg dry wt.	100	1000	46		05/09/06 12:47	
7439-95-4	Magnesium, Total	46000	mg/kg dry wt.	25	6200	86		05/09/06 12:51	
7439-96-5	Manganese, Total	430	mg/kg dry wt.	1	10	0.14		05/08/06 12:45	
7440-09-7	Potassium, Total	5200	mg/kg dry wt.	1	100	7.5		05/08/06 12:45	
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	05/08/06 12:45	UL,M
7440-66-6	Zinc, Total	60	mg/kg dry wt.	1	4.0	0.85		05/08/06 12:45	L,M

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SS11B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 18:00
Solids: 68.00
Laboratory ID: 0604436-08

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	47000	mg/kg dry wt.	25	1200	40		05/09/06 13:12	
7440-39-3	Barium, Total	110	mg/kg dry wt.	1	5.0	0.10		05/08/06 12:50	
7440-41-7	Beryllium, Total	2.3	mg/kg dry wt.	1	1.0	0.016		05/08/06 12:50	
7440-70-2	Calcium, Total	2400	mg/kg dry wt.	1	250	10		05/08/06 12:50	L,m
7440-47-3	Chromium, Total	52	mg/kg dry wt.	1	5.0	0.57		05/08/06 12:50	L,m
7440-48-4	Cobalt, Total	7.4	mg/kg dry wt.	1	1.0	0.35		05/08/06 12:50	L,m
7439-89-6	Iron, Total	49000	mg/kg dry wt.	100	1000	46		05/09/06 13:08	
7439-95-4	Magnesium, Total	40000	mg/kg dry wt.	25	6200	86		05/09/06 13:12	
7439-96-5	Manganese, Total	430	mg/kg dry wt.	1	10	0.14		05/08/06 12:50	
7440-09-7	Potassium, Total	4200	mg/kg dry wt.	1	100	7.5		05/08/06 12:50	
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	05/08/06 12:50	UL,m
7440-66-6	Zinc, Total	60	mg/kg dry wt.	1	4.0	0.85		05/08/06 12:50	L,m

01573

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SS13B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 19:15
Solids: 73.00
Laboratory ID: 0604436-09

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	32000	mg/kg dry wt.	50	2500	79		05/09/06 13:17	
7440-39-3	Barium, Total	53	mg/kg dry wt.	1	5.0	0.10		05/08/06 12:55	
7440-41-7	Beryllium, Total	2.1	mg/kg dry wt.	1	1.0	0.016		05/08/06 12:55	
7440-70-2	Calcium, Total	1200	mg/kg dry wt.	1	250	10		05/08/06 12:55	L,M
7440-47-3	Chromium, Total	53	mg/kg dry wt.	1	5.0	0.57		05/08/06 12:55	L,M
7440-48-4	Cobalt, Total	9.5	mg/kg dry wt.	1	1.0	0.35		05/08/06 12:55	L,M
7439-89-6	Iron, Total	44000	mg/kg dry wt.	50	500	23		05/09/06 13:17	
7439-95-4	Magnesium, Total	33000	mg/kg dry wt.	50	12000	170		05/09/06 13:17	
7439-96-5	Manganese, Total	230	mg/kg dry wt.	1	10	0.14		05/08/06 12:55	
7440-09-7	Potassium, Total	6400	mg/kg dry wt.	1	100	7.5		05/08/06 12:55	
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	05/08/06 12:55	UL,M
7440-66-6	Zinc, Total	51	mg/kg dry wt.	1	4.0	0.85		05/08/06 12:55	L,M

001674

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB12A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:15
Solids: 75.00
Laboratory ID: 0604436-10

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	33000	mg/kg dry wt.	50	2500	79		05/09/06 13:21	
7440-39-3	Barium, Total	80	mg/kg dry wt.	1	5.0	0.10		05/08/06 12:59	
7440-41-7	Beryllium, Total	1.6	mg/kg dry wt.	1	1.0	0.016		05/08/06 12:59	
7440-70-2	Calcium, Total	13000	mg/kg dry wt.	1	250	10		05/08/06 12:59	L,m
7440-47-3	Chromium, Total	47	mg/kg dry wt.	1	5.0	0.57		05/08/06 12:59	L,m
7440-48-4	Cobalt, Total	13	mg/kg dry wt.	1	1.0	0.35		05/08/06 12:59	L,m
7439-89-6	Iron, Total	34000	mg/kg dry wt.	50	500	23		05/09/06 13:21	
7439-95-4	Magnesium, Total	30000	mg/kg dry wt.	50	12000	170		05/09/06 13:21	
7439-96-5	Manganese, Total	550	mg/kg dry wt.	1	10	0.14		05/08/06 12:59	
7440-09-7	Potassium, Total	4500	mg/kg dry wt.	1	100	7.5		05/08/06 12:59	
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	05/08/06 12:59	UL,m
7440-66-6	Zinc, Total	59	mg/kg dry wt.	1	4.0	0.85		05/08/06 12:59	L,m

01675

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB12B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:30
Solids: 67.00
Laboratory ID: 0604436-11

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	69000	mg/kg dry wt.	25	1200	40		05/09/06 13:29	
7440-39-3	Barium, Total	92	mg/kg dry wt.	1	5.0	0.10		05/08/06 13:04	
7440-41-7	Beryllium, Total	3.2	mg/kg dry wt.	1	1.0	0.016		05/08/06 13:04	
7440-70-2	Calcium, Total	1100	mg/kg dry wt.	1	250	10		05/08/06 13:04	L,M
7440-47-3	Chromium, Total	63	mg/kg dry wt.	1	5.0	0.57		05/08/06 13:04	L,M
7440-48-4	Cobalt, Total	8.4	mg/kg dry wt.	1	1.0	0.35		05/08/06 13:04	L,M
7439-89-6	Iron, Total	62000	mg/kg dry wt.	100	1000	46		05/09/06 13:25	
7439-95-4	Magnesium, Total	35000	mg/kg dry wt.	25	6200	86		05/09/06 13:29	
7439-96-5	Manganese, Total	330	mg/kg dry wt.	1	10	0.14		05/08/06 13:04	
7440-09-7	Potassium, Total	3900	mg/kg dry wt.	1	100	7.5		05/08/06 13:04	
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	05/08/06 13:04	UL,M
7440-66-6	Zinc, Total	78	mg/kg dry wt.	1	4.0	0.85		05/08/06 13:04	L,M

01676

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB12C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:45
Solids: 68.00
Laboratory ID: 0604436-12

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	32000	mg/kg dry wt.	50	2500	79		05/09/06 13:33	
7440-39-3	Barium, Total	86	mg/kg dry wt.	1	5.0	0.10		05/08/06 13:08	
7440-41-7	Beryllium, Total	1.8	mg/kg dry wt.	1	1.0	0.016		05/08/06 13:08	
7440-70-2	Calcium, Total	3200	mg/kg dry wt.	1	250	10		05/08/06 13:08	L,M
7440-47-3	Chromium, Total	46	mg/kg dry wt.	1	5.0	0.57		05/08/06 13:08	L,M
7440-48-4	Cobalt, Total	15	mg/kg dry wt.	1	1.0	0.35		05/08/06 13:08	L,M
7439-89-6	Iron, Total	37000	mg/kg dry wt.	50	500	23		05/09/06 13:33	
7439-95-4	Magnesium, Total	50000	mg/kg dry wt.	50	12000	170		05/09/06 13:33	
7439-96-5	Manganese, Total	410	mg/kg dry wt.	1	10	0.14		05/08/06 13:08	
7440-09-7	Potassium, Total	5000	mg/kg dry wt.	1	100	7.5		05/08/06 13:08	
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	05/08/06 13:08	UL,M
7440-66-6	Zinc, Total	50	mg/kg dry wt.	1	4.0	0.85		05/08/06 13:08	L,M

01677

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SS12B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 13:30
Solids: 68.00
Laboratory ID: 0604436-13

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	35000	mg/kg dry wt.	100	5000	160		05/09/06 13:37	
7440-39-3	Barium, Total	98	mg/kg dry wt.	1	5.0	0.10		05/08/06 13:13	
7440-41-7	Beryllium, Total	2.2	mg/kg dry wt.	1	1.0	0.016		05/08/06 13:13	
7440-70-2	Calcium, Total	4100	mg/kg dry wt.	1	250	10		05/08/06 13:13	L,M
7440-47-3	Chromium, Total	54	mg/kg dry wt.	1	5.0	0.57		05/08/06 13:13	L,M
7440-48-4	Cobalt, Total	22	mg/kg dry wt.	1	1.0	0.35		05/08/06 13:13	L,M
7439-89-6	Iron, Total	55000	mg/kg dry wt.	100	1000	46		05/09/06 13:37	
7439-95-4	Magnesium, Total	55000	mg/kg dry wt.	100	25000	340		05/09/06 13:37	
7439-96-5	Manganese, Total	500	mg/kg dry wt.	10	100	1.4		05/09/06 14:10	
7440-09-7	Potassium, Total	6600	mg/kg dry wt.	1	100	7.5		05/08/06 13:13	
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	05/08/06 13:13	UL,M
7440-66-6	Zinc, Total	53	mg/kg dry wt.	1	4.0	0.85		05/08/06 13:13	L,M

01578

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:15
Solids: 84.00
Laboratory ID: 0604436-14

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	10000	mg/kg dry wt.	1	50	1.6		05/08/06 13:53	
7440-39-3	Barium, Total	120	mg/kg dry wt.	1	5.0	0.10		05/08/06 13:53	
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.016		05/08/06 13:53	
7440-70-2	Calcium, Total	4200	mg/kg dry wt.	1	250	10		05/08/06 13:53	L,M
7440-47-3	Chromium, Total	18	mg/kg dry wt.	1	5.0	0.57		05/08/06 13:53	L,M
7440-48-4	Cobalt, Total	7.9	mg/kg dry wt.	1	1.0	0.35		05/08/06 13:53	L,M
7439-89-6	Iron, Total	17000	mg/kg dry wt.	25	250	11		05/09/06 14:31	
7439-95-4	Magnesium, Total	3400	mg/kg dry wt.	1	250	3.4		05/08/06 13:53	
7439-96-5	Manganese, Total	280	mg/kg dry wt.	1	10	0.14		05/08/06 13:53	
7440-09-7	Potassium, Total	930	mg/kg dry wt.	1	100	7.5		05/08/06 13:53	J,F
7440-23-5	Sodium, Total	160	mg/kg dry wt.	1	100	19		05/08/06 13:53	L,M
7440-66-6	Zinc, Total	150	mg/kg dry wt.	2	8.0	1.7		05/09/06 16:05	L,M

01575

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB15B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:30
Solids: 76.00
Laboratory ID: 0604436-15

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	22000	mg/kg dry wt.	1	50	1.6		05/08/06 13:58	
7440-39-3	Barium, Total	130	mg/kg dry wt.	1	5.0	0.10		05/08/06 13:58	
7440-41-7	Beryllium, Total	0.78	mg/kg dry wt.	1	1.0	0.016	J	05/08/06 13:58	
7440-70-2	Calcium, Total	6400	mg/kg dry wt.	1	250	10		05/08/06 13:58	L,M
7440-47-3	Chromium, Total	31	mg/kg dry wt.	1	5.0	0.57		05/08/06 13:58	L,M
7440-48-4	Cobalt, Total	10	mg/kg dry wt.	1	1.0	0.35		05/08/06 13:58	L,M
7439-89-6	Iron, Total	17000	mg/kg dry wt.	25	250	11		05/09/06 14:35	
7439-95-4	Magnesium, Total	4200	mg/kg dry wt.	1	250	3.4		05/08/06 13:58	
7439-96-5	Manganese, Total	440	mg/kg dry wt.	1	10	0.14		05/08/06 13:58	
7440-09-7	Potassium, Total	1700	mg/kg dry wt.	1	100	7.5		05/08/06 13:58	
7440-23-5	Sodium, Total	1000	mg/kg dry wt.	1	100	19		05/08/06 13:58	L,M
7440-66-6	Zinc, Total	180	mg/kg dry wt.	2	8.0	1.7		05/09/06 16:22	L,M

01686

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB15C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:45
Solids: 68.00
Laboratory ID: 0604436-16

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	9300	mg/kg dry wt.	1	50	1.6		05/08/06 14:02	
7440-39-3	Barium, Total	250	mg/kg dry wt.	1	5.0	0.10		05/08/06 14:02	
7440-41-7	Beryllium, Total	0.39	mg/kg dry wt.	1	1.0	0.016	J	05/08/06 14:02	
7440-70-2	Calcium, Total	18000	mg/kg dry wt.	1	250	10		05/08/06 14:02	L,M
7440-47-3	Chromium, Total	66	mg/kg dry wt.	1	5.0	0.57		05/08/06 14:02	L,M
7440-48-4	Cobalt, Total	4.3	mg/kg dry wt.	1	1.0	0.35		05/08/06 14:02	L,M
7439-89-6	Iron, Total	8900	mg/kg dry wt.	25	250	11		05/09/06 14:39	
7439-95-4	Magnesium, Total	2600	mg/kg dry wt.	1	250	3.4		05/08/06 14:02	
7439-96-5	Manganese, Total	170	mg/kg dry wt.	1	10	0.14		05/08/06 14:02	
7440-09-7	Potassium, Total	510	mg/kg dry wt.	1	100	7.5		05/08/06 14:02	
7440-23-5	Sodium, Total	1400	mg/kg dry wt.	1	100	19		05/08/06 14:02	L,M
7440-66-6	Zinc, Total	16000	mg/kg dry wt.	200	800	170		05/09/06 16:26	L,M

01681

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB16A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 09:30
Solids: 85.00
Laboratory ID: 0604436-17

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	14000	mg/kg dry wt.	1	50	1.6		05/08/06 14:07	
7440-39-3	Barium, Total	180	mg/kg dry wt.	1	5.0	0.10		05/08/06 14:07	
7440-41-7	Beryllium, Total	1.1	mg/kg dry wt.	1	1.0	0.016		05/08/06 14:07	
7440-70-2	Calcium, Total	12000	mg/kg dry wt.	1	250	10		05/08/06 14:07	LM
7440-47-3	Chromium, Total	27	mg/kg dry wt.	1	5.0	0.57		05/08/06 14:07	LM
7440-48-4	Cobalt, Total	8.3	mg/kg dry wt.	1	1.0	0.35		05/08/06 14:07	LM
7439-89-6	Iron, Total	26000	mg/kg dry wt.	50	500	23		05/09/06 14:56	
7439-95-4	Magnesium, Total	7000	mg/kg dry wt.	1	250	3.4		05/08/06 14:07	
7439-96-5	Manganese, Total	320	mg/kg dry wt.	1	10	0.14		05/08/06 14:07	
7440-09-7	Potassium, Total	910	mg/kg dry wt.	1	100	7.5		05/08/06 14:07	
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19		05/08/06 14:07	LM
7440-66-6	Zinc, Total	130	mg/kg dry wt.	2	8.0	1.7		05/09/06 16:30	LM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB16B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 09:45
Solids: 74.00
Laboratory ID: 0604436-18

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	31000	mg/kg dry wt.	50	2500	79		05/09/06 15:00	
7440-39-3	Barium, Total	63	mg/kg dry wt.	1	5.0	0.10		05/08/06 14:11	
7440-41-7	Beryllium, Total	1.3	mg/kg dry wt.	1	1.0	0.016		05/08/06 14:11	
7440-70-2	Calcium, Total	1000	mg/kg dry wt.	1	250	10		05/08/06 14:11	L,m
7440-47-3	Chromium, Total	47	mg/kg dry wt.	1	5.0	0.57		05/08/06 14:11	L,m
7440-48-4	Cobalt, Total	11	mg/kg dry wt.	1	1.0	0.35		05/08/06 14:11	L,m
7439-89-6	Iron, Total	36000	mg/kg dry wt.	50	500	23		05/09/06 15:00	
7439-95-4	Magnesium, Total	14000	mg/kg dry wt.	1	250	3.4		05/08/06 14:11	
7439-96-5	Manganese, Total	390	mg/kg dry wt.	1	10	0.14		05/08/06 14:11	
7440-09-7	Potassium, Total	3000	mg/kg dry wt.	1	100	7.5		05/08/06 14:11	
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	05/08/06 14:11	UL,m
7440-66-6	Zinc, Total	51	mg/kg dry wt.	1	4.0	0.85		05/08/06 14:11	L,m

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

71SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:00
Solids: 65.00
Laboratory ID: 0604436-19

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	24000	mg/kg dry wt.	1	50	1.6		05/08/06 14:35	
7440-39-3	Barium, Total	50	mg/kg dry wt.	1	5.0	0.10		05/08/06 14:35	
7440-41-7	Beryllium, Total	1.9	mg/kg dry wt.	1	1.0	0.016		05/08/06 14:35	
7440-70-2	Calcium, Total	1500	mg/kg dry wt.	1	250	10		05/08/06 14:35	L,M
7440-47-3	Chromium, Total	52	mg/kg dry wt.	1	5.0	0.57		05/08/06 14:35	L,M
7440-48-4	Cobalt, Total	14	mg/kg dry wt.	1	1.0	0.35		05/08/06 14:35	L,M
7439-89-6	Iron, Total	38000	mg/kg dry wt.	50	500	23		05/09/06 15:04	
7439-95-4	Magnesium, Total	36000	mg/kg dry wt.	50	12000	170		05/09/06 15:04	
7439-96-5	Manganese, Total	160	mg/kg dry wt.	1	10	0.14		05/08/06 14:35	
7440-09-7	Potassium, Total	6800	mg/kg dry wt.	1	100	7.5		05/08/06 14:35	
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	05/08/06 14:35	UL,M
7440-66-6	Zinc, Total	56	mg/kg dry wt.	1	4.0	0.85		05/08/06 14:35	L,M

001684

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

Dup-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 00:00
Solids: 86.00
Laboratory ID: 0604436-20

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 3050B Digestion
Prepared: 04/28/06 07:05
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0604728

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	15000	mg/kg dry wt.	1	50	1.6		05/08/06 14:39	
7440-39-3	Barium, Total	140	mg/kg dry wt.	1	5.0	0.10		05/08/06 14:39	
7440-41-7	Beryllium, Total	0.94	mg/kg dry wt.	1	1.0	0.016	J	05/08/06 14:39	
7440-70-2	Calcium, Total	2500	mg/kg dry wt.	1	250	10		05/08/06 14:39	L, M
7440-47-3	Chromium, Total	24	mg/kg dry wt.	1	5.0	0.57		05/08/06 14:39	L, M
7440-48-4	Cobalt, Total	8.0	mg/kg dry wt.	1	1.0	0.35		05/08/06 14:39	L, M
7439-89-6	Iron, Total	28000	mg/kg dry wt.	50	500	23		05/09/06 15:08	
7439-95-4	Magnesium, Total	3600	mg/kg dry wt.	1	250	3.4		05/08/06 14:39	
7439-96-5	Manganese, Total	250	mg/kg dry wt.	1	10	0.14		05/08/06 14:39	
7440-09-7	Potassium, Total	1600	mg/kg dry wt.	1	100	7.5		05/08/06 14:39	J, F
7440-23-5	Sodium, Total	170	mg/kg dry wt.	1	100	19		05/08/06 14:39	L, M
7440-66-6	Zinc, Total	120	mg/kg dry wt.	2	8.0	1.7		05/09/06 16:35	L, M

01685

INORGANIC ANALYSIS DATA SHEET

USEPA-6010B

EQBK71

REVISED

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Water

Sampled: 04/21/06 12:20

Solids: 0.00

Laboratory ID: 0604436-36

SDG: 36440-28

Project: RFAAP SWMUs 40 & 71 RI/FS

Preparation: 3010A Digestion

Prepared: 05/02/06 06:25

Initial/Final: 25 mL / 25 mL

QC Batch: 0604827

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	100	ug/L	1	100	16	U	05/08/06 15:06
7440-39-3	Barium, Total	10	ug/L	1	10	0.92	U	05/08/06 15:06
7440-41-7	Beryllium, Total	4.0	ug/L	1	4.0	0.50	U	05/08/06 15:08
7440-70-2	Calcium, Total	500	ug/L	1	500	52	U	05/08/06 15:06
7440-47-3	Chromium, Total	50	ug/L	1	50	5.5	U	05/08/06 15:08
7439-89-6	Iron, Total	41	ug/L	1	100	3.2	J	05/08/06 15:06
7439-95-4	Magnesium, Total	500	ug/L	1	500	32	U	05/08/06 15:06
7440-09-7	Potassium, Total	44	ug/L	1	200	36	J	05/08/06 15:06
7440-23-5	Sodium, Total	500	ug/L	1	500	59	U	05/08/06 15:06
7440-66-6	Zinc, Total	11	ug/L	1	30	7.7	JB	05/08/06 15:08

B,P

SAMPLE ID SUMMARY

USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-28

Client: URS Group, Inc.

Project: RFAAP SWMUs 40 & 71 RFI/CMS

Client Sample Id:	Lab Sample Id:
71SB14A	0604436-01
71SB14B	0604436-02
71SB14C	0604436-03
71SB13A	0604436-04
71SB13B	0604436-05
71SB13C	0604436-06
Dup-2	0604436-07
71SS11B	0604436-08
71SS13B	0604436-09
71SB12A	0604436-10
71SB12B	0604436-11
71SB12C	0604436-12
71SS12B	0604436-13
71SB15A	0604436-14
71SB15B	0604436-15
71SB15C	0604436-16
71SB16A	0604436-17
71SB16B	0604436-18
71SB16C	0604436-19
Dup-3	0604436-20

02761

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB14A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:50
Solids: 82.00
Laboratory ID: 0604436-01

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.79	mg/kg dry wt.	1	0.10	0.0048		05/03/06 09:33

02752

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB14B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:55
Solids: 77.00
Laboratory ID: 0604436-02

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.3003 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	2.4	mg/kg dry wt.	5	0.50	0.024		05/03/06 13:58

02763

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB14C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 11:00
Solids: 80.00
Laboratory ID: 0604436-03

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.56	mg/kg dry wt.	1	0.10	0.0048		05/03/06 09:42

62754

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 15:50
Solids: 82.00
Laboratory ID: 0604436-04

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.2995 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.49	mg/kg dry wt.	1	0.10	0.0048		05/03/06 09:47

02755

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB13B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:15
Solids: 73.00
Laboratory ID: 0604436-05

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.2998 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.10	mg/kg dry wt.	1	0.10	0.0048	U	05/03/06 09:52

B2
X

02766

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB13C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:30
Solids: 72.00
Laboratory ID: 0604436-06

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.2997 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.052	mg/kg dry wt.	1	0.10	0.0048	J	05/03/06 09:57

B1
JL

02767

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

Dup-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 00:00
Solids: 70.00
Laboratory ID: 0604436-07

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.2998 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.045	mg/kg dry wt.	1	0.10	0.0048	J	05/03/06 10:02

B7
L

02755

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SS11B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 18:00
Solids: 68.00
Laboratory ID: 0604436-08

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.078	mg/kg dry wt.	1	0.10	0.0048	J	05/03/06 10:07

02769

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SS13B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 19:15
Solids: 73.00
Laboratory ID: 0604436-09

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.3001 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.059	mg/kg dry wt.	1	0.10	0.0048	J	05/03/06 10:23

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB12A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:15
Solids: 75.00
Laboratory ID: 0604436-10

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.2996 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.070	mg/kg dry wt.	1	0.10	0.0048	J	05/03/06 10:28

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB12B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:30
Solids: 67.00
Laboratory ID: 0604436-11

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.3004 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.10	mg/kg dry wt.	1	0.10	0.0048		05/03/06 10:33

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB12C

REVISED 6/14/06

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:45
Solids: 68.00
Laboratory ID: 0604436-12

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMA
Preparation: 7471A Mercury, Total
Prepared: 05/02/06 14:00
Initial/Final: 0.2998 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.014	mg/kg dry wt.	1	0.10	0.0048	JB	05/03/06 10:38

B,P

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SS12B

REVISED 6/12/06

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 13:30
Solids: 68.00
Laboratory ID: 0604436-13

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury, Total
Prepared: 05/02/06 14:00
Initial/Final: 0.3002 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7439-97-6	Mercury, Total	0.0099	mg/kg dry wt.	1	0.10	0.0048	JB	05/03/06 10:43	B, P

02774

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB15A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:15
Solids: 84.00
Laboratory ID: 0604436-14

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.3004 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.24	mg/kg dry wt.	1	0.10	0.0048		05/03/06 10:58

B, I

02775

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB15B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:30
Solids: 76.00
Laboratory ID: 0604436-15

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	11	mg/kg dry wt.	25	2.5	0.12		05/03/06 14:34

02775

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB15C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:45
Solids: 68.00
Laboratory ID: 0604436-16

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.3003 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	2.0	mg/kg dry wt.	5	0.50	0.024		05/03/06 14:08

02777

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB16A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 09:30
Solids: 85.00
Laboratory ID: 0604436-17

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.2997 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.19	mg/kg dry wt.	1	0.10	0.0048		05/03/06 11:19

B, x

02778

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB16B

REVISED
KH 6/29/06

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 09:45
Solids: 74.00
Laboratory ID: 0604436-18

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury, Total
Prepared: 05/02/06 14:00
Initial/Final: 0.3001 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7439-97-6	Mercury, Total	0.023	mg/kg dry wt.	1	0.10	0.0048	JB	05/03/06 11:24	B, P

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

71SB16C

REVISED CM 6/12/06

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:00
Solids: 65.00
Laboratory ID: 0604436-19

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury, Total
Prepared: 05/02/06 14:00
Initial/Final: 0.3004 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.025	mg/kg dry wt.	1	0.10	0.0048	JB	05/03/06 11:29

B, P

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

Dup-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 00:00
Solids: 86.00
Laboratory ID: 0604436-20

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 05/02/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0604829

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.31	mg/kg dry wt.	1	0.10	0.0048		05/03/06 11:34

B
J

X

02781

SAMPLE ID SUMMARY

USEPA-7470A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-28

Client: URS Group, Inc.

Project: RFAAP SWMUs 40 & 71 RFI/CMS

Client Sample Id:	Lab Sample Id:
EQBK71	0604436-36

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

EQBK71

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Water
Sampled: 04/21/06 12:20
Solids: 0.00
Laboratory ID: 0604436-36

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: 7470A Digestion - Total
Prepared: 05/03/06 14:00
Initial/Final: 40 mL / 40 mL
QC Batch: 0604927

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.071	ug/L	1	0.40	0.037	J	05/04/06 14:51

02783

SAMPLE ID SUMMARY

USEPA-3550B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Client Sample Id:	Lab Sample Id:
71SB14A	0604436-01
71SB14B	0604436-02
71SB14C	0604436-03
71SB13A	0604436-04
71SB13B	0604436-05
71SB13C	0604436-06
Dup-2	0604436-07
71SS11B	0604436-08
71SS13B	0604436-09
71SB12A	0604436-10
71SB12B	0604436-11
71SB12C	0604436-12
71SS12B	0604436-13
71SB15A	0604436-14
71SB15B	0604436-15
71SB15C	0604436-16
71SB16A	0604436-17
71SB16B	0604436-18
71SB16C	0604436-19
Dup-3	0604436-20
40SS9	0604436-21
Dup-1	0604436-22
40SS17	0604436-23
40SS8	0604436-24
40SS16	0604436-25
40SS15	0604436-26
40SS7	0604436-27
40SS14	0604436-28
40SS6	0604436-29
40SS18	0604436-30
40SS10	0604436-31
40SS11	0604436-32
Dup-5	0604436-33
40SS12	0604436-34
40SS13	0604436-35

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB14A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:50
Solids: 82.00
Laboratory ID: 0604436-01

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	82	%	1	0.1	0.1		04/28/06 15:30

02846

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB14B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:55
Solids: 77.00
Laboratory ID: 0604436-02

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	77	%	1	0.1	0.1		04/28/06 15:30

02847

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB14C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 11:00
Solids: 80.00
Laboratory ID: 0604436-03

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	80	%	1	0.1	0.1		04/28/06 15:30

: 02848

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 15:50
Solids: 82.00
Laboratory ID: 0604436-04

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	82	%	1	0.1	0.1		04/28/06 15:30

02849

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB13B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:15
Solids: 73.00
Laboratory ID: 0604436-05

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	73	%	1	0.1	0.1		04/28/06 15:30

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB13C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 16:30
Solids: 72.00
Laboratory ID: 0604436-06

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	72	%	1	0.1	0.1		04/28/06 15:30

02851

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

Dup-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 00:00
Solids: 70.00
Laboratory ID: 0604436-07

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	70	%	1	0.1	0.1		04/28/06 15:30

02852

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SS11B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 18:00
Solids: 68.00
Laboratory ID: 0604436-08

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	68	%	1	0.1	0.1		04/28/06 15:30

02853

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SS13B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 19:15
Solids: 73.00
Laboratory ID: 0604436-09

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	73	%	1	0.1	0.1		04/28/06 15:30

: 62854

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB12A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:15
Solids: 75.00
Laboratory ID: 0604436-10

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	75	%	1	0.1	0.1		04/28/06 15:30

02855

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB12B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:30
Solids: 67.00
Laboratory ID: 0604436-11

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	67	%	1	0.1	0.1		04/28/06 15:30

02858

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB12C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 17:45
Solids: 68.00
Laboratory ID: 0604436-12

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	68	%	1	0.1	0.1		04/28/06 15:30

62857

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SS12B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/20/06 13:30
Solids: 68.00
Laboratory ID: 0604436-13

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604820

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	68	%	1	0.1	0.1		04/28/06 15:30

02858

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB15A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:15
Solids: 84.00
Laboratory ID: 0604436-14

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	84	%	1	0.1	0.1		04/28/06 15:30

: 02859

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB15B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:30
Solids: 76.00
Laboratory ID: 0604436-15

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604819

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	76	%	1	0.1	0.1		04/28/06 15:30

02860

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB15C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:45
Solids: 68.00
Laboratory ID: 0604436-16

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604820

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	68	%	1	0.1	0.1		04/28/06 15:30

02861

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB16A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 09:30
Solids: 85.00
Laboratory ID: 0604436-17

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604820

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	85	%	1	0.1	0.1		04/28/06 15:30

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB16B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 09:45
Solids: 74.00
Laboratory ID: 0604436-18

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604820

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	74	%	1	0.1	0.1		04/28/06 15:30

62863

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

71SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 10:00
Solids: 65.00
Laboratory ID: 0604436-19

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604820

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	65	%	1	0.1	0.1		04/28/06 15:30

02864

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

Dup-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 00:00
Solids: 86.00
Laboratory ID: 0604436-20

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 04/28/06 15:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604820

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	86	%	1	0.1	0.1		04/28/06 15:30

02865

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS9

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 15:00
Solids: 68.00
Laboratory ID: 0604436-21

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	68	%	1	0.1	0.1		05/01/06 11:30

02866

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

Dup-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 00:00
Solids: 71.00
Laboratory ID: 0604436-22

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	71	%	1	0.1	0.1		05/01/06 11:30

02867

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS17

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 15:15
Solids: 67.00
Laboratory ID: 0604436-23

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	67	%	1	0.1	0.1		05/01/06 11:30

02855

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS8

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 15:20
Solids: 66.00
Laboratory ID: 0604436-24

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	66	%	1	0.1	0.1		05/01/06 11:30

02869

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS16

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 15:30
Solids: 65.00
Laboratory ID: 0604436-25

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	65	%	1	0.1	0.1		05/01/06 11:30

02876

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS15

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 15:35
Solids: 64.00
Laboratory ID: 0604436-26

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	64	%	1	0.1	0.1		05/01/06 11:30

02871

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS7

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 15:45
Solids: 67.00
Laboratory ID: 0604436-27

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	67	%	1	0.1	0.1		05/01/06 11:30

02872

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 15:50
Solids: 67.00
Laboratory ID: 0604436-28

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	67	%	1	0.1	0.1		05/01/06 11:30

02873

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 15:55
Solids: 71.00
Laboratory ID: 0604436-29

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	71	%	1	0.1	0.1		05/01/06 11:30

: 028674

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS18

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 16:00
Solids: 69.00
Laboratory ID: 0604436-30

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	69	%	1	0.1	0.1		05/01/06 11:30

: 62875

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS10

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 16:20
Solids: 70.00
Laboratory ID: 0604436-31

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	70	%	1	0.1	0.1		05/01/06 11:30

02876

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS11

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 16:30
Solids: 68.00
Laboratory ID: 0604436-32

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	68	%	1	0.1	0.1		05/01/06 11:30

02877

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

Dup-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 00:00
Solids: 65.00
Laboratory ID: 0604436-33

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	65	%	1	0.1	0.1		05/01/06 11:30

: 02878

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS12

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 16:45
Solids: 61.00
Laboratory ID: 0604436-34

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	61	%	1	0.1	0.1		05/01/06 11:30

02879

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

40SS13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 04/21/06 16:50
Solids: 66.00
Laboratory ID: 0604436-35

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 05/01/06 11:30
Initial/Final: 10 g / 10 mL
QC Batch: 0604863

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	66	%	1	0.1	0.1		05/01/06 11:30

: 02580

DATA VALIDATION WORKSHEET

Pesticides/PCBs

PCBs only

Reviewer: RA
Date: 5/23/06
DV Level: II (III) IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
X project QAPP

Project Name: Rad Ford
Project Number:
Laboratory: TN Matrix
SDG No.: 36490-256
Test Name: ~~PEST~~/PCB
Method No.: ~~8081A~~/8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, or special circumstances affecting the quality of the data?	✓		
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 °C, then flag L(+)/UL(-).			
1.5	Do any soil samples contain more than 50% water? If yes, no dry weight correction is made and make notes in the DV Report.		✓	

Notes: COC DUP-1 Field sample ID DUP-4 Incorrect COC ✓

2.0 Holding Times		Yes	No	NA
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks prepared at the appropriate frequency (one per 20 samples or batch and matrix)?	✓		
3.2	Do any blanks have positive results? If yes, positive sample results should be reported and qualified "B", if the [sample≤5X[blank].		✓	
3.3	Do any field equipment blanks have positive results? If yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve for 1016, 1260, toxaphene, and technical chlordane; and at least one point for the other arochlors reported? If no, flag "R".	Y		
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".	Y		
4.3	Were continuing calibration standards analyzed every 12 hours or twenty samples? If no, flag "R".	Y		
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±15%) or %D(≤15%) within the control limits?	Y		
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>15%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 15%, J(+), only. Negative Bias - %D>-15% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes:

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning, every 12 hours, and at the end of every sequence.	Y		
5.2	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non detect DDT results, DDD/DDE - R(+).	Y		
5.3	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	Y		
5.4	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	Y		

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Advisory limit: 60-150%.	✓		
6.3	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?		✓	
6.4	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)	✓		

# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
1 out	high/low	No action	No action
2 out	2 high same column	K	No action
	2 low same column	L, UL	No action
	mixed same column	J, UJ	No action
	2 high diff columns	J	Not applicable
	2 low diff columns	J, UJ	Not applicable
	mixed diff columns	Professional judgement	Not applicable
3 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	2 high, 1 low	K (2 high)	J (1 low 2nd column)
	2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
	other mixed	J, UJ	Not applicable
4 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	Mixed	J, UJ	Not applicable

If any recovery is >0% and <10% then L(+)/R(-).
If any recovery is 0% then R(+/-).

Notes:

Sur. diluted out for 715B14B Df=20 No action

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.2	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		✓	

Notes: 715B15A & DUP-3 RL

PCB-1254	.90	0.21	.16	Δ>2 XRL → J,F
PCB-1248	ND	.037J	OK✓	

40559 & DUP-1 RL

PCB-1254	.026J	.054	.049 OK✓
PCB-1260	.022J	ND	OK✓

40559 & DUP-5 RL

PCB-1254	.047J	.26	.051	OK✓

.255

10.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns <40%? If No, J(+).		✓	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes: Several >40% → J,q

PCB-1254 "E" in 715B14B → J,q use DF=20

11.0 Data Completeness

		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit 95%$_{aq}$ and 90%$_{so}$)	✓		
11.1.1	Number of samples: Pest PCB			
11.1.2	Number of target compounds in each analysis: PEST PCB			
11.1.3	Number of results rejected and not reported: Pest PCB			
11.1.4	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = Pest PCB 100%			

Notes:

DUAL COLUMN CONFIRMATION CHECK

71SB14B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71
Matrix: Soil
Laboratory ID: 0604436-02
File ID: A166080-0
Sampled: 04/20/06 16:55
Prepared: 04/27/06 09:09
Analyzed: 05/01/06 21:14
Solids: 77.00
Preparation: 3550B Sonication
Instrument: 144
QC Batch: 0604702
Sequence: 6050252
GC Column(1): RTX CLP2
GC Column(2): RTX CLP

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1254	* 1	6.29		6.29	3730000		3.7	55.2
	2	7.17		7.17	3480000		2.1	

* Column used for quantitation

00505

DUAL COLUMN CONFIRMATION CHECK

71SB14C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71
Matrix: Soil
Laboratory ID: 0604436-03
File ID: A166081-0
Sampled: 04/21/06 11:00
Prepared: 04/27/06 09:09
Analyzed: 05/01/06 21:31
Solids: 80.00
Preparation: 3550B Sonication
Instrument: 144
QC Batch: 0604702
Sequence: 6050252
GC Column(1): RTX CLP2
GC Column(2): RTX CLP

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1248	* 1	6.3		6.3	272399.1		0.082	32.6
	2	5.33		5.33	290901.8		0.059	
PCB-1254	* 1	6.3		6.3	456147.3		0.54	45.5
	2	7.18		7.18	493912.1		0.34	
PCB-1260	1	6.69	7.59333	0.903	293364.8		0.061	
	* 2	6.72	6.71167	0.00833	206526.2		0.070	13.7

* Column used for quantitation

: 0091i

DUAL COLUMN CONFIRMATION CHECK

71SB13A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71
Matrix: Soil
Laboratory ID: 0604436-04
File ID: A166082-0
Sampled: 04/20/06 15:50
Prepared: 04/27/06 09:09
Analyzed: 05/01/06 21:49
Solids: 82.00
Preparation: 3550B Sonication
Instrument: 144
QC Batch: 0604702
Sequence: 6050252
GC Column(1): RTX CLP2
GC Column(2): RTX CLP

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1248	* 1	6.3		6.3	340631.8		0.45	50.0
	2	5.33		5.33	352316.8		0.27	
PCB-1254	* 1	6.3		6.3	409411.3		0.46	48.6
	2	7.18		7.18	452120.6		0.28	
PCB-1260	1	7.28	7.59333	0.313	233848.8		0.091	
	* 2	6.72	6.71167	0.00833	193285.3		0.092	1.1

* Column used for quantitation

: 00912

DUAL COLUMN CONFIRMATION CHECK

71SB15B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71
Matrix: Soil
Laboratory ID: 0604436-15
File ID: A166096-0
Sampled: 04/21/06 10:30
Prepared: 04/27/06 09:09
Analyzed: 05/02/06 01:58
Solids: 76.00
Preparation: 3550B Sonication
Instrument: 144
QC Batch: 0604702
Sequence: 6050252
GC Column(1): RTX CLP2
GC Column(2): RTX CLP

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1248	* 1	6.3		6.3	282371		0.21	47.1
	2	5.33		5.33	274191.8		0.13	
PCB-1254	* 1	6.3		6.3	461751.1		0.61	56.8
	2	7.18		7.18	447422.5		0.34	

* Column used for quantitation

00316

DUAL COLUMN CONFIRMATION CHECK

71SB15C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71
Matrix: Soil
Laboratory ID: 0604436-16
File ID: A166097-0
Sampled: 04/21/06 10:45
Prepared: 04/27/06 09:09
Analyzed: 05/02/06 02:16
Solids: 68.00
Preparation: 3550B Sonication
Instrument: 144
QC Batch: 0604702
Sequence: 6050252
GC Column(1): RTX CLP2
GC Column(2): RTX CLP

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1248	* 1	4.74		4.74	596586.6		0.28	11.3
	2	5.04		5.04	1350000		0.25	
PCB-1254	* 1	5.57		5.57	824180.6		0.58	49.5
	2	5.04		5.04	1080000		0.35	
PCB-1260	1	6.69	7.59333	0.903	270164.8		0.11	
	* 2	6.73	6.71167	0.0183	191488		0.12	8.7

* Column used for quantitation

00917

DUAL COLUMN CONFIRMATION CHECK

40SS9

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71
Matrix: Soil
Laboratory ID: 0604436-21
File ID: A166220-0
Sampled: 04/21/06 15:00
Prepared: 04/28/06 09:11
Analyzed: 05/04/06 14:56
Solids: 68.00
Preparation: 3550B Sonication
Instrument: 144
QC Batch: 0604703
Sequence: 6050504
GC Column(1): RTX CLP2
GC Column(2): RTX CLP

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1254	1	7.01		7.01	21822.36		0.013	
	* 2	7.18		7.18	45140.01		0.026	66.7
PCB-1260	1	7.01	7.59333	0.583	20783.45		0.020	
	* 2	6.71	6.71167	0.00167	31504.57		0.022	9.5

* Column used for quantitation

DUAL COLUMN CONFIRMATION CHECK

40SS14

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71
Matrix: Soil
Laboratory ID: 0604436-28
File ID: A166228-0
Sampled: 04/21/06 15:50
Prepared: 04/28/06 09:11
Analyzed: 05/04/06 17:18
Solids: 67.00
Preparation: 3550B Sonication
Instrument: 144
QC Batch: 0604703
Sequence: 6050504
GC Column(1): RTX CLP2
GC Column(2): RTX CLP

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1254	1	7.01		7.01	32159.88		0.023	
	* 2	7.18		7.18	58642.89		0.055	82.1
PCB-1260	1	7.01	7.59333	0.583	28814.23		0.030	
	* 2	6.71	6.71167	0.00167	43453.79		0.033	9.5

* Column used for quantitation

DATA VALIDATION WORKSHEET

Gasoline Range Organics

Reviewer: RA
Date: 3/24/06
DV Level: II (III) IV
Review Document:
Ψ NFG/SW-846 Ψ Project QAPP/SAP
___ NJDEP/SW-846 Ψ Region III Modified
___ NFG/CLP ___ other

Project Name: Radford
Project Number:
Laboratory: Trimatrix
SDG No.: 36440-28
Test Name: GRO
Method No.: 8015

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, L(+)/UL(-).	✓		
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes: EQBK 71 extracted 5days past ht ⇒ ND, UL+k

3.0 Instrument Calibration		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: CCV 05/04/06 at 1036
%D 7.15% at 15.8%.
and results ND → UJ, C

4.0 Blanks (Laboratory and Field)		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times (3 times and 10 times rule for NJDEP) the blank value are determined for positive and negative blank values. "B" Flags		✓	
4.3	Were there any transcription/calculation errors in blank data?			✓
4.4	Do any field equipment blanks/trip blanks have positive results?			
4.5	Are there field equipment blank/trip blanks associated with every sample?	✓		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Was a field blank used for MS/MSD analyses?		✓	
6.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? If Yes, for %R > UCL, K(+) only; for %R < LCL, L(+)/UL(-), for %R < 30%, L(+)/R(-).		✓	
6.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
6.6	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits? If Yes, J(+)/UJ(-).		✓	
7.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? If Yes, J(+).		✓	
7.5	Were there any transcription /calculation errors?			✓

Notes:

8.0 Laboratory Duplicate		Yes	No	NA
8.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
8.3	Are all analyte duplicate results within control limits? If No, J(+).	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
9.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.	✓		
9.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes:

All NDs ✓

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Are all sample results within the calibrated range?	✓		
10.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
10.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
10.4	Were there any transcription /calculation errors?		✓	

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit 95%)	✓		
11.1.1	Number of samples:			
11.1.2	Number of target compounds in each analysis:			
11.1.3	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = 100 %.			

Notes:

HOLDING TIME SUMMARY
USEPA-8015B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-28

Client: URS Group, Inc. Project: RFAAP SWMUs 40 & 71 RFI/CMS

Method: Volatile Petroleum Hydrocarbons by EPA Method 8015B

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
71SB14A	04/20/06	04/24/06		05/02/06	12	14	05/03/06	0	14	
71SB14B	04/20/06	04/24/06		05/02/06	12	14	05/03/06	1	14	
71SB14C	04/21/06	04/24/06		05/02/06	11	14	05/03/06	1	14	
71SB13A	04/20/06	04/24/06		05/02/06	12	14	05/03/06	1	14	
71SB13B	04/20/06	04/24/06		05/02/06	12	14	05/03/06	1	14	
71SB13C	04/20/06	04/24/06		05/02/06	12	14	05/03/06	1	14	
Dup-2	04/20/06	04/24/06		05/02/06	13	14	05/03/06	1	14	
71SS11B	04/20/06	04/24/06		05/02/06	12	14	05/03/06	1	14	
71SS13B	04/20/06	04/24/06		05/02/06	12	14	05/03/06	1	14	
71SB12A	04/20/06	04/24/06		05/02/06	12	14	05/03/06	1	14	
71SB12B	04/20/06	04/24/06		05/03/06	13	14	05/04/06	1	14	
71SB12C	04/20/06	04/24/06		05/03/06	13	14	05/04/06	1	14	
71SS12B	04/20/06	04/24/06		05/03/06	13	14	05/04/06	1	14	
71SB15A	04/21/06	04/24/06		05/03/06	12	14	05/04/06	1	14	
71SB15B	04/21/06	04/24/06		05/03/06	12	14	05/04/06	1	14	
71SB15C	04/21/06	04/24/06		05/03/06	12	14	05/04/06	1	14	
71SB16A	04/21/06	04/24/06		05/03/06	12	14	05/04/06	1	14	
71SB16B	04/21/06	04/24/06		05/03/06	12	14	05/04/06	1	14	
71SB16C	04/21/06	04/24/06		05/03/06	12	14	05/04/06	1	14	
Dup-3	04/21/06	04/24/06		05/03/06	13	14	05/04/06	1	14	
EQBK71	04/21/06	04/24/06		05/10/06	19	14	05/10/06	0	14	*

01676

CONTINUING CALIBRATION CHECK
USEPA-8015B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Instrument ID: 140
Calibration: 6E11001
Lab File ID: B61_281
Calibration Date: 05/03/06 15:00
Sequence: 6051077
Injection Date: 05/04/06
Lab Sample ID: 6051077-CCV2
Injection Time: 10:36

Analyte	Type	CONC. (ug/L)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
GRO - 8015B (C6-C10)	A	400	341	4506.6	3796.74		-15.8	15 *

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

01279

TriMatrix Laboratories, Inc. **ANALYSIS SEQUENCE** **6051077** Page 1 of 1 Printed: 5/18/2006 10:58:57PM

Volatiles GC, Soil, May-03-06

Instrument = 140, Calibration = 6E11001

Sequence Analyses:
GRO EPA 8015B

Lab Number	*Analysis*	*Contain*	*STD ID*	*ISTD ID*	*Client / QC Type*	*Extraction Comments*
6051077-CAL1	QC		A605388		CAL STANDARD	
6051077-CAL2	QC		A605389		CAL STANDARD	
6051077-CAL3	QC		A605390		CAL STANDARD	
6051077-CAL4	QC		A605391		CAL STANDARD	
6051077-CAL5	QC		A605392		CAL STANDARD	
6051077-CAL6	QC		A605393		CAL STANDARD	
6051077-SCV1	QC		A605387		SECONDARY CAL CHECK	
0605157-BLK2	QC				BLANK	
0605157-BS2	QC				LCS	
6051077-ICV1	QC		A605305		INITIAL CAL CHECK	
0604436-11	GRO EPA 8015B	C			URS Group, Inc.	
0604436-12	GRO EPA 8015B	B			URS Group, Inc.	
0604436-13	GRO EPA 8015B	B			URS Group, Inc.	
0604436-14	GRO EPA 8015B	B			URS Group, Inc.	
0604436-15	GRO EPA 8015B	B			URS Group, Inc.	
0604436-16	GRO EPA 8015B	B			URS Group, Inc.	
0604436-17	GRO EPA 8015B	B			URS Group, Inc.	
0604436-18	GRO EPA 8015B	B			URS Group, Inc.	
0605157-MS1	QC				MATRIX SPIKE	
0605157-MSD1	QC				MATRIX SPIKE DUP	
6051077-CCV1	QC		A605305		CALIBRATION CHECK	
0604436-19	GRO EPA 8015B	B			URS Group, Inc.	
0604436-20	GRO EPA 8015B	C			URS Group, Inc.	
6051077-CCV2	QC		A605305		CALIBRATION CHECK	

Comments:

Analyst Initials:

seq_TriMatrix.rpt

DATA VALIDATION WORKSHEET

Diesel Range Organics

Reviewer: RA
Date: 5/24/06
DV Level: II (III) IV

Review Document:

- Y NFG/SW-846
- ___ NJDEP/SW-846
- ___ NFG/CLP
- Y Project QAPP/SAP
- Y Region III Modified
- ___ other

Project Name: Rad Ford
Project Number:
Laboratory: TriMatrix
SDG No.: 36440-28
Test Name: DRO
Method No.: 8015

No anomalies

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, L(+)/UL(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

3.0 Instrument Calibration		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times (3 times and 10 times rule for NJDEP) the blank value are determined for positive and negative blank values. "B" Flags		✓	
4.3	Were there any transcription/calculation errors in blank data?			✓
4.4	Do any field equipment blanks/trip blanks have positive results?		✓	
4.5	Are there field equipment blank/trip blanks associated with every sample?	✓		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Was a field blank used for MS/MSD analyses?		✓	
6.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? If Yes, for %R > UCL, K(+) only; for %R < LCL, L(+)/UL(-), for %R < 30%, L(+)/R(-).		✓	
6.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
6.6	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits? If Yes, J(+)/UJ(-).		✓	
7.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? If Yes, J(+).		✓	✓
7.5	Were there any transcription /calculation errors?			✓

Notes:

8.0 Laboratory Duplicate		Yes	No	NA
8.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
8.3	Are all analyte duplicate results within control limits? If No, J(+).	✓		✓
8.4	Were there any transcription /calculation errors?			✓

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
9.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.	✓		✓
9.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes: DUP-2 and 715S11B 715B15A and DUP-3
DRO 3.4J 3.4J OK✓ 21 20 OK✓

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Are all sample results within the calibrated range?	✓		
10.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		✓
10.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
10.4	Were there any transcription /calculation errors?		✓	✓

Notes:

11.0 Data Completeness

		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit 95%)	✓		
11.1.1	Number of samples:			
11.1.2	Number of target compounds in each analysis:			
11.1.3	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-28
Project No.: _____

Project Name: Radford
Reviewer: RA
Date: 5/24/06

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓			✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓			✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓			✓				
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{o}C \pm 2\ ^{o}C$)	✓			✓			✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes, % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓			✓					

Note: _____

2.0 Holding Time		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓			✓				

Note: _____

3.0 Instrument Calibration		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".	✓			✓			✓					
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).	✓			✓			✓					
3.3	Once per calibration, did a high and low distilled standard recovery within 85-115%? If no, follow 3.6.												
3.4	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓			✓					
3.5	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓			✓					
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP 90%-110%, FOR Hg 80-120%, FOR CN 85-115%.	✓			✓			✓					
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%												
3.7	For ICP & ICPMS, did the CRDL standard recover between 80-120%?		✓		✓								
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K												

Note: _____

4.0 Blanks

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓			✓					
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓			✓					
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓			✓			✓					
	Sample Results > MDL												
	< 5X Blank Contamination B												
4.4	Are there negative blank results with the absolute value > MDL?		✓		✓				✓				
	Sample Results Non-detects > MDL												
	< 5X absolute Blank Contamination UL L												
4.5	Are there reported field blank > ± MDL?		✓		✓			✓					
	Sample Results > MDL												
	< 5X Blank Contamination B												

Note: CCB, ICB, low levels all <5x, no action 6020 → MB several pos hits → <5x, B, P and CCB pos for As, all <5x, no action Sample 6010
6010 MBs → Ba, Ca, Fe, K, Zn. Pos <5x B, P in eq. blank.
EB → Fe 41, K 44 ug/L all <5x, no action
Mercury MB → 0.0048 <5x → B, P → <5x → B, J
FB → EQBK71 at 0.071 ug/L

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	✓			✓								
5.2	Are the ICS AB recoveries within 80% - 120%?	✓			✓								
5.3	Are the results for unspiked analytes (in ICS A) < ± RL?	✓			✓								
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			✓						
	If not...												
	Action: Not Spiked Analytes: < -MDL L(+)/UL(-); > MDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)												

Note:

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓			✓					
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓			✓				
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)												

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓			✓					
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.												
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	✓			✓			✓					

Note:

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.				✓			✓					
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125% for aqueous matrices or lab limits for soil matrices?					✓		✓					
	%R > 125% 30%< %R < 74% < 30% Positive K L L Non-detect None UL R												
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.				✓					✓			

Note: 6010 Soil Ca 18/18%, Cr 22/38, Co 47%, ~~Ni~~ Zinc 60%. PDS Mn 65% no action for MS Sodium 74%, 74%. LUL+M

6020 As 72%/72%, Copper 74%, Se 73%, 71% → UM unless prev. B,P

9.0 Instrument Detection Limits (IDL)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?				✓			✓					

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓			✓								
10.2	Was a five-fold dilution performed?	✓			✓								
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).		✓			✓							

Note:

6010 Zinc 14.3%. 7 QC all prev. flagged for MS failure no more action

6020 → Copper 19.6%, Nickel 17%, V 12.9%. J/S unless prev. for MS failure.

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓			✓					
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.												
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		✓ (Prev Lim)			✓			✓				

Note: Method 6010 7158154, Dup-3 total Ca 50.7%) total K 53% → J,F
Method 6020 7158154, Dup-3 arsenic 96.2%) copper 94.5%) lead 117.9%) Vanadium 189.5%
J,F unless prev. flagged.

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓			✓					
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓			✓					
12.3	Were the Internal Standard recoveries within 30-120%	✓			✓								
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	✓											
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	✓											
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	✓											

Note: _____

13.0 Completeness Calculation		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓			✓					
13.1.1	Number of samples: _____												
13.1.2	Number of target compounds in each analysis: _____												
13.1.3	Number of results rejected and not reported: _____												
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%												

Note: _____

71SS11B and Dup-2

Method 6010

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total aluminum	mg/kg	1200	6000	47000	43000	8.9%	4000	4800	P
total barium	mg/kg	5	25	110	100	9.5%	10	20	P
total beryllium	mg/kg	1	5	2.3	2.3	0.0%	0	4	P
total calcium	mg/kg	250	1250	2400	2400	0.0%	0	1000	P
total chromium	mg/kg	5	25	52	54	3.8%	2	20	P
total cobalt	mg/kg	1	5	7.4	7.5	1.3%	0.1	4	P
total iron	mg/kg	1000	5000	49000	50000	2.0%	1000	4000	P
total magnesium	mg/kg	6200	31000	40000	46000	14.0%	6000	24800	P
total manganese	mg/kg	10	50	430	430	0.0%	0	40	P
total potassium	mg/kg	100	500	4200	5200	21.3%	1000	400	P
total sodium	mg/kg	100	500	100	100	0.0%	0	400	P
total zinc	mg/kg	4	20	60	60	0.0%	0	16	P

Control limit [sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

71SB15A and Dup-3

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total aluminum	mg/kg	50	250	10000	15000	40.0%	5000	200	P
total barium	mg/kg	5	25	120	140	15.4%	20	20	P
total beryllium	mg/kg	1	5	1.0	0.9	6.2%	0.06	4	P
total calcium	mg/kg	250	1250	4200	2500	**50.7%**	1700	1000	**F**
total chromium	mg/kg	5	25	18	24	28.6%	6	20	P
total cobalt	mg/kg	1	5	7.9	8.0	1.3%	0.1	4	P
total iron	mg/kg	250	1250	17000	28000	48.9%	11000	1000	P
total magnesium	mg/kg	250	1250	3400	3600	5.7%	200	1000	P
total manganese	mg/kg	10	50	280	250	11.3%	30	40	P
total potassium	mg/kg	100	500	930	1600	**53.0%**	670	400	**F**
total sodium	mg/kg	100	500	160	170	6.1%	10	400	P
total zinc	mg/kg	8	40	150	120	22.2%	30	32	P

71SS11B and Dup-2

Method 6020

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total arsenic	mg/kg	0.4	2	3	2.3	26.4%	0.7	1.6	P
total cadmium	mg/kg	1	5	0.041	0.035	15.8%	0.006	4	P
total copper	mg/kg	1	5	26.0	23.0	12.2%	3	4	P
total lead	mg/kg	1	5	11	8.8	22.2%	2.2	4	P
total nickel	mg/kg	0.5	2.5	40	35	13.3%	5	2	P
total selenium	mg/kg	1	5	0.49	0.44	10.8%	0.05	4	P
total silver	mg/kg	3	15	0.21	0.19	10.0%	0	12	P
total thallium	mg/kg	0.5	3	0.38	0.28	30.3%	0.1	2	P
total vanadium	mg/kg	5	25	110	89	21.1%	21	20	P
total antimony	mg/kg	0.5	2.5	0.11	0.11	0.0%	0	2	P

Control limit [sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

71SB15A and Dup-3

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total arsenic	mg/kg	0.4	2	0.068	15	**198.2%**	14.932	1.6	**F**
total cadmium	mg/kg	1	5	0.42	0.3	33.3%	0.12	4	P
total copper	mg/kg	1	5	24.0	67.0	**94.5%**	43	4	**F**
total lead	mg/kg	1	5	8	31	**117.9%**	23	4	**F**
total nickel	mg/kg	0.5	3	19	19	0.0%	0	2	P
total selenium	mg/kg	1	5	0.24	0.7	98.9%	0.47	4	P
total silver	mg/kg	3	15	0.022	0.12	138.0%	0	12	P
total thallium	mg/kg	0.5	2.5	0.44	0.54	20.4%	0.1	2	P
total vanadium	mg/kg	5	25	1	37	**189.5%**	36	20	**F**
total antimony	mg/kg	0.5	2.5	0.88	1.4	45.6%	0.52	2	P

BLANKS
USEPA-6020

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Sequence: 6050257
Instrument ID: 114
Calibration: 6E03011

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050257-ICB1	Antimony, Total	-0.00000800	0.0010	0.00036	mg/L	U	05/02/06 14:27
6050257-CCB1	Antimony, Total	-0.00016	0.0010	0.00036	mg/L	U	05/02/06 14:36
6050257-CCB2	Antimony, Total	-0.00023	0.0010	0.00036	mg/L	U	05/02/06 15:00
6050257-CCB3	Antimony, Total	-0.00029	0.0010	0.00036	mg/L	U	05/02/06 15:23
6050257-CCB4	Antimony, Total	-0.00030	0.0010	0.00036	mg/L	U	05/02/06 15:46
0604758-BLK1	Antimony, Total	0.50	0.50	0.036	mg/kg dry wt.	J	05/02/06 16:02
6050257-CCB5	Antimony, Total	-0.00030	0.0010	0.00036	mg/L	U	05/02/06 16:09
6050257-CCB6	Antimony, Total	-0.00034	0.0010	0.00036	mg/L	U	05/02/06 16:33
6050257-CCB7	Antimony, Total	-0.00035	0.0010	0.00036	mg/L	U	05/02/06 16:56
6050257-CCB8	Antimony, Total	-0.00036	0.0010	0.00036	mg/L	J	05/02/06 17:06

* Values outside of QC limits

x5 = 2.5

02286

BLANKS
USEPA-6020

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Sequence: 6050523
Instrument ID: 114
Calibration: 6E08001

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050523-ICB1	Arsenic, Total	0.00000400	0.0040	0.00023	mg/L	U	05/05/06 10:36
	Cadmium, Total	0.00	0.010	0.000073	mg/L	U	05/05/06 10:36
	Copper, Total	-0.00000100	0.010	0.00022	mg/L	U	05/05/06 10:36
	Lead, Total	0.00000100	0.010	0.00041	mg/L	U	05/05/06 10:36
	Nickel, Total	-0.00000700	0.0050	0.00027	mg/L	U	05/05/06 10:36
	Selenium, Total	0.0000290	0.010	0.00063	mg/L	U	05/05/06 10:36
	Silver, Total	0.00000600	0.030	0.00017	mg/L	U	05/05/06 10:36
	Thallium, Total	0.00000100	0.0050	0.000085	mg/L	U	05/05/06 10:36
6050523-CCB1	Arsenic, Total	0.000011	0.0040	0.00023	mg/L	U	05/05/06 10:55
	Cadmium, Total	0.0	0.010	0.000073	mg/L	U	05/05/06 10:55
	Copper, Total	0.0000040	0.010	0.00022	mg/L	U	05/05/06 10:55
	Lead, Total	0.0000010	0.010	0.00041	mg/L	U	05/05/06 10:55
	Nickel, Total	0.0000020	0.0050	0.00027	mg/L	U	05/05/06 10:55
	Selenium, Total	-0.0000040	0.010	0.00063	mg/L	U	05/05/06 10:55
	Silver, Total	0.0000050	0.030	0.00017	mg/L	U	05/05/06 10:55
	Thallium, Total	0.0000010	0.0050	0.000085	mg/L	U	05/05/06 10:55
6050523-CCB2	Arsenic, Total	-0.000039	0.0040	0.00023	mg/L	U	05/05/06 11:35
	Cadmium, Total	0.0000020	0.010	0.000073	mg/L	U	05/05/06 11:35
	Copper, Total	0.000026	0.010	0.00022	mg/L	U	05/05/06 11:35
	Lead, Total	0.0000010	0.010	0.00041	mg/L	U	05/05/06 11:35
	Nickel, Total	0.0000010	0.0050	0.00027	mg/L	U	05/05/06 11:35
	Selenium, Total	-0.000018	0.010	0.00063	mg/L	U	05/05/06 11:35
	Silver, Total	0.0000070	0.030	0.00017	mg/L	U	05/05/06 11:35
	Thallium, Total	0.0	0.0050	0.000085	mg/L	U	05/05/06 11:35
0604727-BLK1	Arsenic, Total	0.40	0.40	0.023	mg/kg dry wt.	J	05/05/06 11:54
	Cadmium, Total	1.0	1.0	0.0073	mg/kg dry wt.	U	05/05/06 11:54
	Copper, Total	0.032	1.0	0.022	mg/kg dry wt.	J	05/05/06 11:54
	Lead, Total	1.0	1.0	0.041	mg/kg dry wt.	U	05/05/06 11:54
	Nickel, Total	0.21	0.50	0.027	mg/kg dry wt.	J	05/05/06 11:54
	Selenium, Total	1.0	1.0	0.063	mg/kg dry wt.	U	05/05/06 11:54
	Silver, Total	3.0	3.0	0.017	mg/kg dry wt.	U	05/05/06 11:54
	Thallium, Total	0.50	0.50	0.0085	mg/kg dry wt.	U	05/05/06 11:54
6050523-CCB3	Arsenic, Total	-0.000031	0.0040	0.00023	mg/L	U	05/05/06 12:14

BLANKS
USEPA-6020

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Sequence: 6050535
Instrument ID: 114
Calibration: 6E09014

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050535-ICB1	Arsenic, Total	0.00000400	0.0040	0.00023	mg/L	U	05/08/06 14:06
	Copper, Total	0.0000100	0.010	0.00022	mg/L	U	05/08/06 14:06
	Lead, Total	0.00000400	0.010	0.00041	mg/L	U	05/08/06 14:06
	Vanadium, Total	0.0000170	0.010	0.00024	mg/L	U	05/08/06 14:06
6050535-CCB1	Arsenic, Total	0.000055	0.0040	0.00023	mg/L	U	05/08/06 14:19
	Copper, Total	0.0000080	0.010	0.00022	mg/L	U	05/08/06 14:19
	Lead, Total	0.0000030	0.010	0.00041	mg/L	U	05/08/06 14:19
	Vanadium, Total	0.000026	0.010	0.00024	mg/L	U	05/08/06 14:19
6050535-CCB2	Arsenic, Total	0.0013	0.0040	0.00023	mg/L	J	05/08/06 14:35
	Copper, Total	-0.0000050	0.010	0.00022	mg/L	U	05/08/06 14:35
	Lead, Total	0.000010	0.010	0.00041	mg/L	U	05/08/06 14:35
	Vanadium, Total	-0.000011	0.010	0.00024	mg/L	U	05/08/06 14:35
6050535-CCB3	Copper, Total	0.0	0.010	0.00022	mg/L	U	05/08/06 14:50
	Vanadium, Total	0.000063	0.010	0.00024	mg/L	U	05/08/06 14:50
6050535-CCB4	Vanadium, Total	0.000057	0.010	0.00024	mg/L	U	05/08/06 15:14
0604727-BLK2	Vanadium, Total	0.040	1.0	0.024	mg/kg dry wt.	J	05/08/06 15:25
6050535-CCB5	Vanadium, Total	0.000071	0.010	0.00024	mg/L	U	05/08/06 15:37

* Values outside of QC limits

02285

METHOD BLANK DATA SHEET
USEPA-6020

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Matrix: Water
Laboratory ID: 0604826-BLK1
File ID: 6050508-017
Prepared: 05/02/06 06:20
Preparation: 3010A Digestion
Initial/Final: 25 mL / 25 mL
Analyzed: 05/05/06 09:26
Instrument: 114
QC Batch: 0604826
Sequence: 6050508
Calibration: 6E05008

CAS No.	Analyte	MDL	MRL	Conc. (ug/L)	Q
7440-36-0	Antimony, Total	0.73	3.0	1.3	J
7440-38-2	Arsenic, Total	0.47	2.0	2.0	U
7440-43-9	Cadmium, Total	0.062	0.50	0.50	U
7440-48-4	Cobalt, Total	0.22	10	10	U
7440-50-8	Copper, Total	0.32	3.0	3.0	U
7439-92-1	Lead, Total	0.22	1.0	1.0	U
7439-96-5	Manganese, Total	0.74	10	10	U
7440-02-0	Nickel, Total	0.80	3.0	3.0	U
7782-49-2	Selenium, Total	0.73	3.0	3.0	U
7440-22-4	Silver, Total	0.073	0.50	0.50	U
7440-28-0	Thallium, Total	0.14	1.0	1.0	U
7440-62-2	Vanadium, Total	0.26	10	10	U

02301

METHOD BLANK DATA SHEET
USEPA-6020

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Matrix: Soil
Laboratory ID: 0604727-BLK2
File ID: 6050535-042
Prepared: 04/28/06 07:03
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
Analyzed: 05/08/06 15:25
Instrument: 114
QC Batch: 0604727
Sequence: 6050535
Calibration: 6E09014

CAS No.	Analyte	MDL	MRL	Conc. (mg/kg dry wt.)	Q
7440-62-2	Vanadium, Total	0.024	1.0	0.040	J

02259

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020

71SS12B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Soil

SDG: 36440-28

Project: RFAAP SWMUs 40 & 71 RFI/CMS

Preparation: 3050B Digestion

Initial/Final: 0.4998 g / 50 mL

Laboratory ID: 0604727-MS1

QC Batch: 0604727

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Arsenic, Total	20.0	1.10	15.6	72	60 - 141	mg/kg dry wt.
Cadmium, Total	20.0	0.0326	19.4	97	65 - 134	mg/kg dry wt.
Copper, Total	20.0	29.0	43.8	74	47 - 144	mg/kg dry wt.
Lead, Total	20.0	5.92	26.1	101	74 - 132	mg/kg dry wt.
Nickel, Total	20.0	32.2	49.9	88	56 - 137	mg/kg dry wt.
Selenium, Total	20.0	0.288	14.8	73	51 - 137	mg/kg dry wt.
Silver, Total	20.0	0.189	20.0	99	47 - 132	mg/kg dry wt.
Thallium, Total	20.0	0.213	20.7	102	87 - 121	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

02362

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-6020

71SS12B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Matrix: Soil
Preparation: 3050B Digestion
Initial/Final: 0.4995 g / 50 mL
Laboratory ID: 0604727-MSD1
QC Batch: 0604727

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Arsenic, Total	20.0	15.6	72	0	20	60 - 141	mg/kg dry wt.
Cadmium, Total	20.0	19.2	96	1	20	65 - 134	mg/kg dry wt.
Copper, Total	20.0	45.8	84	4	20	47 - 144	mg/kg dry wt.
Lead, Total	20.0	26.0	100	0.4	20	74 - 132	mg/kg dry wt.
Nickel, Total	20.0	49.5	86	0.8	20	56 - 137	mg/kg dry wt.
Selenium, Total	20.0	14.5	71	2	20	51 - 137	mg/kg dry wt.
Silver, Total	20.0	19.8	98	1	20	47 - 132	mg/kg dry wt.
Thallium, Total	20.0	21.4	106	3	20	87 - 121	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6020

71SS12B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Matrix: Soil
Preparation: 3050B Digestion
% Solids: 68.00
Initial/Final: 0.5005 g / 50 mL
Laboratory ID: 0604727-PS1
QC Batch: 0604727
Lab Source ID: 0604436-13
Sequence: 6051115

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Arsenic, Total	75 - 125	0.0908	0.0110	0.100	80	mg/L
Cadmium, Total	75 - 125	0.0976	0.000326	0.100	97	mg/L
Copper, Total	75 - 125	0.378	0.291	0.100	87	mg/L
Lead, Total	75 - 125	0.160	0.0593	0.100	101	mg/L
Nickel, Total	75 - 125	0.416	0.323	0.100	93	mg/L
Selenium, Total	75 - 125	0.0767	0.00288	0.100	74 *	mg/L
Silver, Total	75 - 125	0.100	0.00189	0.100	98	mg/L
Thallium, Total	75 - 125	0.106	0.00214	0.100	104	mg/L

* Values outside of QC limits

: 02308

SERIAL DILUTION
USEPA-6020

71SS12B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Matrix: Soil
% Solids: 68.00
Laboratory ID: 6051115-SRD1
QC Batch: 6051115
Lab Source ID: 0604436-13
Sequence: 6051115

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Arsenic, Total	0.0110		0.0138	J	25.5 #		mg/L	10
Cadmium, Total	0.000326	J	0.000355	U	8.9 #		mg/L	10
Copper, Total	0.291		0.348		19.6	*	mg/L	10
Lead, Total	0.0593		0.0585		1.3		mg/L	10
Nickel, Total	0.323		0.378		17.0	*	mg/L	10
Selenium, Total	0.00288	J	0.00181	U	37.2 #		mg/L	10
Silver, Total	0.00189	J	0.00194	J	2.6 #		mg/L	10
Thallium, Total	0.00214	J	0.00237	J	10.7 #		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

02316

SERIAL DILUTION

USEPA-6020

71SS12B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-28

Client: URS Group, Inc.

Project: RFAAP SWMUs 40 & 71 RFI/CMS

Matrix: Soil

% Solids: 68.00

Laboratory ID: 6051243-SRD1

QC Batch: 6051243

Lab Source ID: 0604436-13

Sequence: 6051243

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Vanadium, Total	0.333		0.376		12.9	*	mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Matrix: Soil
Laboratory ID: 0604728-BLK1
File ID: 6050801-086
Prepared: 04/28/06 07:05
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
Analyzed: 05/08/06 15:06
Instrument: 101
QC Batch: 0604728
Sequence: 6050801
Calibration: 6E09018

CAS No.	Analyte	MDL	MRL	Conc. (mg/kg dry wt.)	Q
7429-90-5	Aluminum, Total	1.6	50	50	U
7440-39-3	Barium, Total	0.10	5.0	0.27	J
7440-41-7	Beryllium, Total	0.016	1.0	1.0	U
7440-70-2	Calcium, Total	10	250	12	J
7440-47-3	Chromium, Total	0.57	5.0	5.0	U
7440-48-4	Cobalt, Total	0.35	1.0	1.0	U
7439-89-6	Iron, Total	0.46	10	1.4	J
7439-95-4	Magnesium, Total	3.4	250	250	U
7439-96-5	Manganese, Total	0.14	10	10	U
7440-09-7	Potassium, Total	7.5	100	13	J
7440-23-5	Sodium, Total	19	100	100	U
7440-66-6	Zinc, Total	0.85	4.0	1.4	J

Ba x 5 = 1.35

Ca x 5 = 60

Fe = 7

K = 65

Zn = 7

01725

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Matrix: Water
Laboratory ID: 0604827-BLK1
File ID: 6050823-014
Prepared: 05/02/06 06:25
Preparation: 3010A Digestion
Initial/Final: 25 mL / 25 mL
Analyzed: 05/08/06 14:45
Instrument: 116
QC Batch: 0604827
Sequence: 6050823
Calibration: 6E09004

CAS No.	Analyte	MDL	MRL	Conc. (ug/L)	Q
7440-41-7	Beryllium, Total	0.50	4.0	4.0	U
7440-47-3	Chromium, Total	5.5	50	50	U
7440-66-6	Zinc, Total	7.7	30	12	J

Zn x5 = 60

01731

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Sequence: 6050801

SDG: 36440-28
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Instrument ID: 101
Calibration: 6E09018

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050801-ICB1	Aluminum, Total	-0.0105	0.50	0.016	mg/L	U	05/08/06 09:59
	Barium, Total	0.00362	0.050	0.0010	mg/L	J	05/08/06 09:59
	Beryllium, Total	0.00000286	0.010	0.00016	mg/L	U	05/08/06 09:59
	Calcium, Total	-0.0584	2.5	0.10	mg/L	U	05/08/06 09:59
	Chromium, Total	0.00121	0.050	0.0057	mg/L	U	05/08/06 09:59
	Cobalt, Total	0.000340	0.010	0.0035	mg/L	U	05/08/06 09:59
	Iron, Total	-0.00990	0.10	0.0046	mg/L	J	05/08/06 09:59
	Magnesium, Total	0.0124	2.5	0.034	mg/L	U	05/08/06 09:59
	Manganese, Total	-0.00572	0.10	0.0014	mg/L	J	05/08/06 09:59
	Potassium, Total	0.150	1.0	0.075	mg/L	J	05/08/06 09:59
	Sodium, Total	0.324	1.0	0.19	mg/L	J	05/08/06 09:59
	Zinc, Total	0.000674	0.040	0.0085	mg/L	U	05/08/06 09:59
6050801-CCB1	Aluminum, Total	0.0053	0.50	0.016	mg/L	U	05/08/06 10:28
	Barium, Total	0.0036	0.050	0.0010	mg/L	J	05/08/06 10:28
	Beryllium, Total	0.00013	0.010	0.00016	mg/L	U	05/08/06 10:28
	Calcium, Total	-0.050	2.5	0.10	mg/L	U	05/08/06 10:28
	Chromium, Total	0.0012	0.050	0.0057	mg/L	U	05/08/06 10:28
	Cobalt, Total	0.00088	0.010	0.0035	mg/L	U	05/08/06 10:28
	Iron, Total	-0.011	0.10	0.0046	mg/L	J	05/08/06 10:28
	Magnesium, Total	0.012	2.5	0.034	mg/L	U	05/08/06 10:28
	Manganese, Total	-0.0052	0.10	0.0014	mg/L	J	05/08/06 10:28
	Potassium, Total	0.14	1.0	0.075	mg/L	J	05/08/06 10:28
	Sodium, Total	0.064	1.0	0.19	mg/L	U	05/08/06 10:28
	Zinc, Total	-0.0019	0.040	0.0085	mg/L	U	05/08/06 10:28
6050801-CCB2	Aluminum, Total	0.012	0.50	0.016	mg/L	U	05/08/06 11:25
	Barium, Total	0.0036	0.050	0.0010	mg/L	J	05/08/06 11:25
	Beryllium, Total	0.000058	0.010	0.00016	mg/L	U	05/08/06 11:25
	Calcium, Total	-0.043	2.5	0.10	mg/L	U	05/08/06 11:25
	Chromium, Total	0.0018	0.050	0.0057	mg/L	U	05/08/06 11:25
	Cobalt, Total	-0.00042	0.010	0.0035	mg/L	U	05/08/06 11:25
	Iron, Total	-0.0038	0.10	0.0046	mg/L	U	05/08/06 11:25
	Magnesium, Total	0.0055	2.5	0.034	mg/L	U	05/08/06 11:25
	Manganese, Total	-0.0054	0.10	0.0014	mg/L	J	05/08/06 11:25

001713

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Sequence: 6050801
Instrument ID: 101
Calibration: 6E09018

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050801-CCB2	Potassium, Total	0.13	1.0	0.075	mg/L	J	05/08/06 11:25
	Sodium, Total	0.066	1.0	0.19	mg/L	U	05/08/06 11:25
	Zinc, Total	0.000080	0.040	0.0085	mg/L	U	05/08/06 11:25
6050801-CCB3	Aluminum, Total	-0.0022	0.50	0.016	mg/L	U	05/08/06 12:27
	Barium, Total	0.0031	0.050	0.0010	mg/L	J	05/08/06 12:27
	Beryllium, Total	0.000078	0.010	0.00016	mg/L	U	05/08/06 12:27
	Calcium, Total	-0.051	2.5	0.10	mg/L	U	05/08/06 12:27
	Chromium, Total	-0.00016	0.050	0.0057	mg/L	U	05/08/06 12:27
	Cobalt, Total	0.00089	0.010	0.0035	mg/L	U	05/08/06 12:27
	Iron, Total	-0.011	0.10	0.0046	mg/L	J	05/08/06 12:27
	Magnesium, Total	0.019	2.5	0.034	mg/L	U	05/08/06 12:27
	Manganese, Total	-0.0055	0.10	0.0014	mg/L	J	05/08/06 12:27
	Potassium, Total	0.13	1.0	0.075	mg/L	J	05/08/06 12:27
	Sodium, Total	-0.19	1.0	0.19	mg/L	J	05/08/06 12:27
	Zinc, Total	-0.00065	0.040	0.0085	mg/L	U	05/08/06 12:27
6050801-CCB4	Aluminum, Total	0.016	0.50	0.016	mg/L	J	05/08/06 13:31
	Barium, Total	0.0034	0.050	0.0010	mg/L	J	05/08/06 13:31
	Beryllium, Total	0.000080	0.010	0.00016	mg/L	U	05/08/06 13:31
	Calcium, Total	-0.038	2.5	0.10	mg/L	U	05/08/06 13:31
	Chromium, Total	-0.00069	0.050	0.0057	mg/L	U	05/08/06 13:31
	Cobalt, Total	-0.00024	0.010	0.0035	mg/L	U	05/08/06 13:31
	Iron, Total	-0.0088	0.10	0.0046	mg/L	J	05/08/06 13:31
	Magnesium, Total	0.034	2.5	0.034	mg/L	J	05/08/06 13:31
	Manganese, Total	-0.0050	0.10	0.0014	mg/L	J	05/08/06 13:31
	Potassium, Total	0.14	1.0	0.075	mg/L	J	05/08/06 13:31
	Sodium, Total	-0.18	1.0	0.19	mg/L	U	05/08/06 13:31
	Zinc, Total	0.00063	0.040	0.0085	mg/L	U	05/08/06 13:31
6050801-CCB5	Aluminum, Total	0.0097	0.50	0.016	mg/L	U	05/08/06 14:30
	Barium, Total	0.0034	0.050	0.0010	mg/L	J	05/08/06 14:30
	Beryllium, Total	-0.000052	0.010	0.00016	mg/L	U	05/08/06 14:30
	Calcium, Total	-0.038	2.5	0.10	mg/L	U	05/08/06 14:30
	Chromium, Total	-0.0033	0.050	0.0057	mg/L	U	05/08/06 14:30
	Cobalt, Total	-0.00054	0.010	0.0035	mg/L	U	05/08/06 14:30

001714

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Sequence: 6050801
Instrument ID: 101
Calibration: 6E09018

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050801-CCB5	Iron, Total	-0.012	0.10	0.0046	mg/L	J	05/08/06 14:30
	Magnesium, Total	0.026	2.5	0.034	mg/L	U	05/08/06 14:30
	Manganese, Total	-0.0054	0.10	0.0014	mg/L	J	05/08/06 14:30
	Potassium, Total	0.13	1.0	0.075	mg/L	J	05/08/06 14:30
	Sodium, Total	-0.17	1.0	0.19	mg/L	U	05/08/06 14:30
	Zinc, Total	-0.0018	0.040	0.0085	mg/L	U	05/08/06 14:30
6050801-CCB6	Aluminum, Total	0.012	0.50	0.016	mg/L	U	05/08/06 14:51
	Barium, Total	0.0035	0.050	0.0010	mg/L	J	05/08/06 14:51
	Beryllium, Total	0.000020	0.010	0.00016	mg/L	U	05/08/06 14:51
	Calcium, Total	-0.041	2.5	0.10	mg/L	U	05/08/06 14:51
	Chromium, Total	-0.0025	0.050	0.0057	mg/L	U	05/08/06 14:51
	Cobalt, Total	0.00078	0.010	0.0035	mg/L	U	05/08/06 14:51
	Iron, Total	-0.0077	0.10	0.0046	mg/L	J	05/08/06 14:51
	Magnesium, Total	0.026	2.5	0.034	mg/L	U	05/08/06 14:51
	Manganese, Total	-0.0050	0.10	0.0014	mg/L	J	05/08/06 14:51
	Potassium, Total	0.12	1.0	0.075	mg/L	J	05/08/06 14:51
	Sodium, Total	-0.15	1.0	0.19	mg/L	U	05/08/06 14:51
	Zinc, Total	-0.00033	0.040	0.0085	mg/L	U	05/08/06 14:51
0604728-BLK1	Aluminum, Total	50	50	1.6	mg/kg dry wt.	U	05/08/06 15:06
	Barium, Total	0.27	5.0	0.10	mg/kg dry wt.	J	05/08/06 15:06
	Beryllium, Total	1.0	1.0	0.016	mg/kg dry wt.	U	05/08/06 15:06
	Calcium, Total	12	250	10	mg/kg dry wt.	J	05/08/06 15:06
	Chromium, Total	5.0	5.0	0.57	mg/kg dry wt.	J	05/08/06 15:06
	Cobalt, Total	1.0	1.0	0.35	mg/kg dry wt.	U	05/08/06 15:06
	Iron, Total	1.4	10	0.46	mg/kg dry wt.	J	05/08/06 15:06
	Magnesium, Total	250	250	3.4	mg/kg dry wt.	U	05/08/06 15:06
	Manganese, Total	10	10	0.14	mg/kg dry wt.	J	05/08/06 15:06
	Potassium, Total	13	100	7.5	mg/kg dry wt.	J	05/08/06 15:06
	Sodium, Total	100	100	19	mg/kg dry wt.	J	05/08/06 15:06
	Zinc, Total	1.4	4.0	0.85	mg/kg dry wt.	J	05/08/06 15:06
6050801-CCB7	Aluminum, Total	0.018	0.50	0.016	mg/L	J	05/08/06 15:55
	Barium, Total	0.0035	0.050	0.0010	mg/L	J	05/08/06 15:55
	Beryllium, Total	-0.000078	0.010	0.00016	mg/L	U	05/08/06 15:55

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Sequence: 6050801
Instrument ID: 101
Calibration: 6E09018

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050801-CCB7	Calcium, Total	-0.044	2.5	0.10	mg/L	U	05/08/06 15:55
	Chromium, Total	-0.0031	0.050	0.0057	mg/L	U	05/08/06 15:55
	Cobalt, Total	0.0013	0.010	0.0035	mg/L	U	05/08/06 15:55
	Iron, Total	-0.0099	0.10	0.0046	mg/L	J	05/08/06 15:55
	Magnesium, Total	0.033	2.5	0.034	mg/L	U	05/08/06 15:55
	Manganese, Total	-0.0051	0.10	0.0014	mg/L	J	05/08/06 15:55
	Potassium, Total	0.14	1.0	0.075	mg/L	J	05/08/06 15:55
	Sodium, Total	-0.10	1.0	0.19	mg/L	U	05/08/06 15:55
	Zinc, Total	0.00091	0.040	0.0085	mg/L	U	05/08/06 15:55
6050801-CCB8	Aluminum, Total	0.024	0.50	0.016	mg/L	J	05/08/06 16:41
	Barium, Total	0.0038	0.050	0.0010	mg/L	J	05/08/06 16:41
	Beryllium, Total	0.000049	0.010	0.00016	mg/L	U	05/08/06 16:41
	Calcium, Total	-0.042	2.5	0.10	mg/L	U	05/08/06 16:41
	Chromium, Total	-0.00077	0.050	0.0057	mg/L	U	05/08/06 16:41
	Cobalt, Total	-0.00060	0.010	0.0035	mg/L	U	05/08/06 16:41
	Iron, Total	-0.0097	0.10	0.0046	mg/L	J	05/08/06 16:41
	Magnesium, Total	0.032	2.5	0.034	mg/L	U	05/08/06 16:41
	Manganese, Total	-0.0050	0.10	0.0014	mg/L	J	05/08/06 16:41
	Potassium, Total	0.17	1.0	0.075	mg/L	J	05/08/06 16:41
	Sodium, Total	-0.013	1.0	0.19	mg/L	U	05/08/06 16:41
	Zinc, Total	-0.00082	0.040	0.0085	mg/L	U	05/08/06 16:41
6050801-CCB9	Aluminum, Total	0.023	0.50	0.016	mg/L	J	05/08/06 17:05
	Barium, Total	0.0038	0.050	0.0010	mg/L	J	05/08/06 17:05
	Beryllium, Total	-0.00011	0.010	0.00016	mg/L	U	05/08/06 17:05
	Calcium, Total	-0.039	2.5	0.10	mg/L	U	05/08/06 17:05
	Chromium, Total	-0.0023	0.050	0.0057	mg/L	U	05/08/06 17:05
	Cobalt, Total	-0.00046	0.010	0.0035	mg/L	U	05/08/06 17:05
	Iron, Total	-0.0075	0.10	0.0046	mg/L	J	05/08/06 17:05
	Magnesium, Total	0.016	2.5	0.034	mg/L	U	05/08/06 17:05
	Manganese, Total	-0.0052	0.10	0.0014	mg/L	J	05/08/06 17:05
	Potassium, Total	0.16	1.0	0.075	mg/L	J	05/08/06 17:05
	Sodium, Total	0.020	1.0	0.19	mg/L	U	05/08/06 17:05
	Zinc, Total	-0.0015	0.040	0.0085	mg/L	U	05/08/06 17:05

* Values outside of QC limits

061715

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Sequence: 6050823
Instrument ID: 116
Calibration: 6E09004

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050823-ICB1	Sodium, Total	-0.0382	0.50	0.059	mg/L	U	05/08/06 14:02
	Aluminum, Total	14.2	100	16	ug/L	U	05/08/06 14:02
	Barium, Total	0.443	10	0.92	ug/L	U	05/08/06 14:02
	Calcium, Total	0.0165	0.50	0.052	mg/L	U	05/08/06 14:02
	Potassium, Total	0.00611	0.20	0.036	mg/L	U	05/08/06 14:02
	Iron, Total	1.02	100	3.2	ug/L	U	05/08/06 14:03
	Magnesium, Total	0.00499	0.50	0.032	mg/L	U	05/08/06 14:03
	Beryllium, Total	0.201	4.0	0.50	ug/L	U	05/08/06 14:04
	Chromium, Total	0.536	50	5.5	ug/L	U	05/08/06 14:04
	Zinc, Total	1.07	30	7.7	ug/L	U	05/08/06 14:04
6050823-CCB1	Sodium, Total	-0.10	0.50	0.059	mg/L	J	05/08/06 14:37
	Aluminum, Total	16	100	16	ug/L	J	05/08/06 14:37
	Barium, Total	0.68	10	0.92	ug/L	U	05/08/06 14:37
	Calcium, Total	0.021	0.50	0.052	mg/L	U	05/08/06 14:37
	Potassium, Total	0.012	0.20	0.036	mg/L	U	05/08/06 14:37
	Iron, Total	1.5	100	3.2	ug/L	U	05/08/06 14:38
	Magnesium, Total	0.021	0.50	0.032	mg/L	U	05/08/06 14:38
	Beryllium, Total	0.15	4.0	0.50	ug/L	U	05/08/06 14:39
	Chromium, Total	1.4	50	5.5	ug/L	U	05/08/06 14:39
	Zinc, Total	1.3	30	7.7	ug/L	U	05/08/06 14:39
0604827-BLK1	Aluminum, Total	100	100	16	ug/L	J	05/08/06 14:43
	Barium, Total	10	10	0.92	ug/L	U	05/08/06 14:43
	Calcium, Total	500	500	52	ug/L	U	05/08/06 14:43
	Potassium, Total	200	200	36	ug/L	U	05/08/06 14:43
	Sodium, Total	500	500	59	ug/L	J	05/08/06 14:43
	Iron, Total	100	100	3.2	ug/L	U	05/08/06 14:43
	Magnesium, Total	500	500	32	ug/L	U	05/08/06 14:43
	Beryllium, Total	4.0	4.0	0.50	ug/L	U	05/08/06 14:45
	Chromium, Total	50	50	5.5	ug/L	U	05/08/06 14:45
	Zinc, Total	12	30	7.7	ug/L	J	05/08/06 14:45
6050823-CCB2	Sodium, Total	-0.036	0.50	0.059	mg/L	U	05/08/06 15:18
	Aluminum, Total	19	100	16	ug/L	J	05/08/06 15:18
	Barium, Total	0.46	10	0.92	ug/L	U	05/08/06 15:18

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Sequence: 6050927
Instrument ID: 101
Calibration: 6E10012

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050927-ICB1	Aluminum, Total	0.000824	0.50	0.016	mg/L	U	05/09/06 11:41
	Iron, Total	-0.0115	0.10	0.0046	mg/L	J	05/09/06 11:41
	Magnesium, Total	0.0239	2.5	0.034	mg/L	U	05/09/06 11:41
	Manganese, Total	-0.00531	0.10	0.0014	mg/L	J	05/09/06 11:41
	Zinc, Total	-0.00311	0.040	0.0085	mg/L	U	05/09/06 11:41
6050927-CCB1	Aluminum, Total	0.0017	0.50	0.016	mg/L	U	05/09/06 12:10
	Iron, Total	-0.012	0.10	0.0046	mg/L	J	05/09/06 12:10
	Magnesium, Total	0.034	2.5	0.034	mg/L	J	05/09/06 12:10
	Manganese, Total	-0.0046	0.10	0.0014	mg/L	J	05/09/06 12:10
	Zinc, Total	-0.0019	0.040	0.0085	mg/L	U	05/09/06 12:10
6050927-CCB2	Aluminum, Total	0.0062	0.50	0.016	mg/L	U	05/09/06 13:04
	Iron, Total	-0.012	0.10	0.0046	mg/L	J	05/09/06 13:04
	Magnesium, Total	0.037	2.5	0.034	mg/L	J	05/09/06 13:04
	Manganese, Total	-0.0051	0.10	0.0014	mg/L	J	05/09/06 13:04
	Zinc, Total	-0.0019	0.040	0.0085	mg/L	U	05/09/06 13:04
6050927-CCB3	Aluminum, Total	0.013	0.50	0.016	mg/L	U	05/09/06 13:58
	Iron, Total	-0.012	0.10	0.0046	mg/L	J	05/09/06 13:58
	Magnesium, Total	0.037	2.5	0.034	mg/L	J	05/09/06 13:58
	Manganese, Total	-0.0049	0.10	0.0014	mg/L	J	05/09/06 13:58
	Zinc, Total	-0.0033	0.040	0.0085	mg/L	U	05/09/06 13:58
6050927-CCB4	Aluminum, Total	0.018	0.50	0.016	mg/L	J	05/09/06 14:52
	Iron, Total	-0.012	0.10	0.0046	mg/L	J	05/09/06 14:52
	Magnesium, Total	0.031	2.5	0.034	mg/L	U	05/09/06 14:52
	Manganese, Total	-0.0048	0.10	0.0014	mg/L	J	05/09/06 14:52
	Zinc, Total	-0.0022	0.040	0.0085	mg/L	U	05/09/06 14:52
6050927-CCB5	Aluminum, Total	0.017	0.50	0.016	mg/L	J	05/09/06 15:21
	Iron, Total	-0.011	0.10	0.0046	mg/L	J	05/09/06 15:21
	Magnesium, Total	0.024	2.5	0.034	mg/L	U	05/09/06 15:21
	Manganese, Total	-0.0046	0.10	0.0014	mg/L	J	05/09/06 15:21
	Zinc, Total	-0.0012	0.040	0.0085	mg/L	U	05/09/06 15:21
6050927-CCB6	Aluminum, Total	0.021	0.50	0.016	mg/L	J	05/09/06 16:18
	Iron, Total	-0.012	0.10	0.0046	mg/L	J	05/09/06 16:18
	Magnesium, Total	0.022	2.5	0.034	mg/L	U	05/09/06 16:18

01719

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Sequence: 6050927
Instrument ID: 101
Calibration: 6E10012

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050927-CCB6	Manganese, Total	-0.0048	0.10	0.0014	mg/L	J	05/09/06 16:18
	Zinc, Total	-0.0015	0.040	0.0085	mg/L	U	05/09/06 16:18
6050927-CCB7	Aluminum, Total	0.021	0.50	0.016	mg/L	J	05/09/06 16:47
	Iron, Total	-0.010	0.10	0.0046	mg/L	J	05/09/06 16:47
	Magnesium, Total	0.025	2.5	0.034	mg/L	U	05/09/06 16:47
	Manganese, Total	-0.0046	0.10	0.0014	mg/L	J	05/09/06 16:47
	Zinc, Total	-0.0017	0.040	0.0085	mg/L	U	05/09/06 16:47

* Values outside of QC limits

: 61726

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

71SS12B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Soil

SDG: 36440-28

Project: RFAAP SWMUs 40 & 71 RFI/CMS

Preparation: 3050B Digestion

Initial/Final: 0.5005 g / 50 mL

Laboratory ID: 0604728-MS1

QC Batch: 0604728

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #		QC Limits Rec.	Units
Barium, Total	25.0	98.5	125	106		65 - 118	mg/kg dry wt.
Beryllium, Total	2.50	2.21	4.17	78		72 - 134	mg/kg dry wt.
Calcium, Total	1250	4120	4350	18	*	70 - 121	mg/kg dry wt.
Chromium, Total	25.0	53.9	59.4	22	*	65 - 112	mg/kg dry wt.
Cobalt, Total	25.0	22.2	34.0	47	*	61 - 120	mg/kg dry wt.
Potassium, Total	1250	6600	7240	51	*	56 - 183	mg/kg dry wt.
Sodium, Total	1250	ND	922	74		64 - 144	mg/kg dry wt.
Zinc, Total	25.0	53.0	68.4	62		47 - 125	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

OK sample 74% spike

01732

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-6010B

71SS12B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Matrix: Soil
Preparation: 3050B Digestion
Initial/Final: 0.5001 g / 50 mL
Laboratory ID: 0604728-MSD1
QC Batch: 0604728

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Barium, Total	25.0	128	118	2	20	65 - 118	mg/kg dry wt.
Beryllium, Total	2.50	4.47	90	7	20	72 - 134	mg/kg dry wt.
Calcium, Total	1250	4350	18 *	0	20	70 - 121	mg/kg dry wt.
Chromium, Total	25.0	63.3	38 *	6	20	65 - 112	mg/kg dry wt.
Cobalt, Total	25.0	41.1	76	19	20	61 - 120	mg/kg dry wt.
Potassium, Total	1250	6940	27 *	4	20	56 - 183	mg/kg dry wt.
Sodium, Total	1250	925	74	0.3	20	64 - 144	mg/kg dry wt.
Zinc, Total	25.0	73.0	80	7	20	47 - 125	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

OKV
Sample 74X spike

001733

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6010B

71SS12B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Matrix: Soil
Preparation: 3050B Digestion
% Solids: 68.00
Initial/Final: 0.01 g / 1 mL
Laboratory ID: 0604728-PS3
QC Batch: 0604728
Lab Source ID: 0604436-13
Sequence: 6050927

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Manganese, Total	75 - 125	6.57	4.95	2.50	65 *	mg/L

* Values outside of QC limits

01746

SERIAL DILUTION
USEPA-6010B

71SS12B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Matrix: Soil
% Solids: 68.00
Laboratory ID: 6050801-SRD2
QC Batch: 6050801
Lab Source ID: 0604436-13
Sequence: 6050801

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Barium, Total	0.985		1.08		9.6		mg/L	10
Beryllium, Total	0.0221		0.0220	J	0.5		mg/L	10
Calcium, Total	41.2		44.8		8.7		mg/L	10
Chromium, Total	0.539		0.584		8.3		mg/L	10
Cobalt, Total	0.222		0.244		9.9		mg/L	10
Potassium, Total	66.0		69.7		5.6		mg/L	10
Sodium, Total	-1.07	U	-2.55	U	138.3 #		mg/L	10
Zinc, Total	0.530		0.606		14.3	*	mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

001744

BLANKS
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-28
Client: URS Group, Inc.
Project: RFAAP SWMUs 40 & 71 RFI/CMS
Sequence: 6050417
Instrument ID: 216
Calibration: 6E04001

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6050417-ICB1	Mercury, Total	0.0136	0.60	0.029	ug/L	U	05/03/06 09:03
6050417-CCB1	Mercury, Total	-0.0082	0.60	0.029	ug/L	U	05/03/06 09:18
0604829-BLK1	Mercury, Total	0.0068	0.10	0.0048	mg/kg dry wt.	J	05/03/06 09:23
6050417-CCB2	Mercury, Total	0.0042	0.60	0.029	ug/L	U	05/03/06 10:17
6050417-CCB3	Mercury, Total	0.0095	0.60	0.029	ug/L	U	05/03/06 11:14
6050417-CCB4	Mercury, Total	0.0064	0.60	0.029	ug/L	U	05/03/06 12:14
6050417-CCB5	Mercury, Total	-0.012	0.60	0.029	ug/L	U	05/03/06 13:17
6050417-CCB6	Mercury, Total	-0.0087	0.60	0.029	ug/L	U	05/03/06 14:18
6050417-CCB7	Mercury, Total	0.0052	0.60	0.029	ug/L	U	05/03/06 14:44

* Values outside of QC limits

MB x5 = [redacted] ~~0.024~~
0.034

02730

SDG CASE NARRATIVE

URS Group, Inc.
Radford Army Ammunition Plant
SWMUs 40 & 71

SDG – 36440-28
MAY 19, 2006

This case narrative is applicable to samples collected from Radford Army Ammunition Plant (the Site), Radford, Virginia by URS Group, Inc. (the Client) and received by TriMatrix Laboratories, Inc. (TriMatrix) on April 24, 2006. The samples were assigned to TriMatrix project sample delivery group (SDG) 36440-28 for analytical services (the Project) to be performed according to:

a) Subcontract No. 129851.UB, Work Order 129877.US, between the Client and TriMatrix

b) Radford Army Ammunition Plant Final Master Work Plan, August, 2003 and SWMUs 40 & 71 Request for Cost Proposal Work Instructions, and

c) verbal and written correspondence between the Client and TriMatrix as the Project progressed.

No part of this Project was subcontracted.

Field Sample and Assigned Laboratory Sample ID Summary

For the samples received, a field sample to laboratory sample ID cross-reference table follows below and on the next page.

Field Sample Name	Laboratory Sample ID	Date Sampled	Date Received
71SB14A	0604436-01	04/20/06	04/24/06
71SB14B	0604436-02	04/20/06	04/24/06
71SB14C	0604436-03	04/21/06	04/24/06
71SB13A	0604436-04	04/20/06	04/24/06
71SB13B	0604436-05	04/20/06	04/24/06
71SB13C	0604436-06	04/20/06	04/24/06
Dup-2	0604436-07	04/20/06	04/24/06
71SS11B	0604436-08	04/20/06	04/24/06
71SS13B	0604436-09	04/20/06	04/24/06
71SB12A	0604436-10	04/20/06	04/24/06
71SB12B	0604436-11	04/20/06	04/24/06
71SB12C	0604436-12	04/20/06	04/24/06
71SS12B	0604436-13	04/20/06	04/24/06
71SB15A	0604436-14	04/21/06	04/24/06
71SB15B	0604436-15	04/21/06	04/24/06

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Individual sample results relate only to the sample tested.

Field Sample and Assigned Laboratory Sample ID Summary – (continued)

Field Sample Name	Laboratory Sample ID	Date Sampled	Date Received
71SB15C	0604436-16	04/21/06	04/24/06
71SB16A	0604436-17	04/21/06	04/24/06
71SB16B	0604436-18	04/21/06	04/24/06
71SB16C	0604436-19	04/21/06	04/24/06
Dup-3	0604436-20	04/21/06	04/24/06
40SS9	0604436-21	04/21/06	04/24/06
Dup-1	0604436-22	04/21/06	04/24/06
40SS17	0604436-23	04/21/06	04/24/06
40SS8	0604436-24	04/21/06	04/24/06
40SS16	0604436-25	04/21/06	04/24/06
40SS15	0604436-26	04/21/06	04/24/06
40SS7	0604436-27	04/21/06	04/24/06
40SS14	0604436-28	04/21/06	04/24/06
40SS6	0604436-29	04/21/06	04/24/06
40SS18	0604436-30	04/21/06	04/24/06
40SS10	0604436-31	04/21/06	04/24/06
40SS11	0604436-32	04/21/06	04/24/06
Dup-5	0604436-33	04/21/06	04/24/06
40SS12	0604436-34	04/21/06	04/24/06
40SS13	0604436-35	04/21/06	04/24/06
EQBK71	0604436-36	04/21/06	04/24/06

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Sample Receipt and Log-in

On April 24, 2006 at 08:50 hrs, five sample coolers containing multiple soil samples and one equipment blank were received at TriMatrix via FedEx (the carrier). The coolers had been shipped from the Site on April 22. One additional cooler (TM1373) with samples was received but those samples were for a separate location at the Site and they were assigned to SDG 36440-27.

The external custody seal affixed to each cooler was intact. The samples were received on ice and in good condition with the exception that cooler TM0973 contained mostly melt water. The receipt temperature of the interior of each cooler was measured via a 'temperature blank' shipped with the cooler; the measured temperatures, in °C, were 4.9, 4.3, 6.9, 2.1, and 12.8.

Shipping documents included six field chain-of-custody forms (COC) and associated carrier air bills.

Samples '71SS12B' and '40SS9' were designated by the Client for MS/MSD analysis for one or more target parameters.

Samples were assigned to SDG 36440-28 and Work Order 0604436.

Sample receipt activities and observations were recorded on TriMatrix Sample Receiving and Log-in Checklists. Copies of the field chain of custody and a LIMS-generated work order have been included at the end of the report. Correspondence regarding sample receipt and project-related matters as analysis progressed is included in Narrative Attachment 1.

Analytical Methods

Sample preparation and analytical methods that were employed are per the quotation and additional correspondence/discussion with the Client.

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Provision of Sample Receipt Information to Client

A copy of the COCs and receipt checklist were transmitted to the Client within one day of sample receipt. The Client did not request any modification(s) to the analyses, as requested on the COC, but did provide clarification.

Post-Receipt Sample Custody

Custody of the sample during sample preparation (if applicable) and analysis was assigned to individual analysts. Copies of completed 'internal chain of custody' forms are included in Section A.

Analytical Methods

Sample preparation and analytical methods that were employed are per the Work Instructions and any subsequent discussion with the Client.

Target Analyte List and Reporting Limits

The target analyte list (by parameter) and reporting limit (goals) employed for the sample are summarized in the Work Instructions and/or as agreed upon with the Client. Each reporting limit employed is at least three times the MDL per the USACE Shell for Analytical Chemistry Requirements (EM200-1-3 Feb 1, 2001) and project Data Quality Objectives (DQO).

Quality Control Limits

Per discussion with the Client, internal quality control limits not to exceed the Work Plan limits were employed except where no Work Plan limits were provided. If an internal lower control limit and/or an internal upper control limit was/were outside the Work Plan limits, one or both internal limits was/were revised to be applicable Work Plan limit(s).

Hold Times

All samples were analyzed within hold time with the exception of sample 'EQBK71' for DRO. However, analysis was conducted within twice the hold time.

Technical Issues

There were no technical issues.

Sample Result Reporting Convention

Sample results are reported as RL "U" (e.g., 0.001 U) if the target analyte was not detected above the MDL. If a sample for an organic parameter (e.g., PCBs) is reanalyzed and also reported, the second analysis includes the suffix "REn" where n = the first, second, etc. reanalysis.

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Data Qualifier Designation

If applicable, sample results are qualified with:

- a "J" flag if the analyte was detected but the concentration is greater than the MDL but less than the RL,
- a "B" flag if the analyte was also detected at or above the RL in the associated method blank and the sample concentration was less than five times the method blank result,
- an "E" flag if the analyte exceeded the instrument calibration range and reanalysis was needed,
- an asterisk (*) if a LIMS-generated statement of qualification applies. Qualifying statements, if any, will be found in Attachment 2 to this narrative.

QC Batch and Analytical Batch Designation

A QC Batch is a seven digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation); it is limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.). An Analytical Batch (or Sequence) is a seven digit number that associates all samples analyzed as a set under one analytical sequence.

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Quality Control Results – Polychlorinated Biphenyls

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications were method-compliant.

Method Blanks

No target analytes were detected at or above the RL on either the primary for confirmation [2C] column. In addition, there were no J-flagged detections.

Surrogates

All surrogate recoveries were in control. Surrogate recoveries were not obtainable for sample '71SB14B' reanalyzed at dilution, however, recoveries from the initial analysis were in control.

Laboratory Control Samples

The Laboratory Control Samples were fortified with Aroclors 1016 and 1260. All recoveries on both columns were in control.

Matrix Spikes

Samples '71SS12B' and '40SS9' were fortified with Aroclors 1016 and 1260. All recoveries and RPDs on both columns were in control.

Sample Results

See Section B. If an analyte is confirmed as present, the higher of the two concentrations has been reported, per the Work Plan. Dual Column Confirmation Check Summaries will be found at the beginning of the Raw Quality Control Data section.

Statements of Data Qualification

See Narrative Attachment 2.

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Quality Control Results – Gasoline Range Organics

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications were method-compliant with the exception that CCV2 for the sequence 6051077 had a %D that exceeded criterion; response was decreasing.

Method Blanks

No target analytes were detected at or above the RL. In addition, there were no J-flagged detections.

Surrogates

All surrogate recoveries were in control.

Laboratory Control Samples

The Laboratory Control Samples were fortified with GRO. All recoveries were in control.

Matrix Spikes

Sample '71SS12B' was fortified with GRO. Both recoveries and the RPD were in control.

Sample Results

See Section C. Due to laboratory oversight, sample 'EQBK1' was analyzed past the 14-day hold time but within twice the hold time. Discovery was at final report generation.

Statements of Data Qualification

See Narrative Attachment 2.

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RA 51 2410b

Quality Control Results – Diesel Range Organics

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications were method-compliant with the exception that CCV2 for the sequence 6051077 had a %D that exceeded criterion; response was decreasing.

Method Blanks

No target analytes were detected at or above the RL. In addition, there were no J-flagged detections.

Surrogates

All surrogate recoveries were in control.

Laboratory Control Samples

The Laboratory Control Samples were fortified with DRO. All recoveries were in control.

Matrix Spikes

Sample '71SS12B' was fortified with DRO. Both recoveries and the RPD were in control.

Sample Results

See Section D.

Statements of Data Qualification

No statements were generated.

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Quality Control Results – ICP Metals

Calibration

All instrument calibrations and continuing calibrations were method-compliant. Note: instrument reports for ICP include the listing of initial calibration correlation coefficients and internal standard recoveries; those values may either be imbedded with raw data from each run or included as a summary (also within the instrument printout).

Method Blanks

No target elements were detected at or above the RL. Depending upon the method blank, there were J-flagged detections for Barium, Calcium, Iron, Potassium, and/or Zinc. Since the project does not allow the use of an instrument's linear range for quantitation, extended calibration curves were employed for Aluminum, Barium, Calcium, Iron, Magnesium, Manganese, and Sodium in order to reduce the number of samples requiring reanalysis at dilution. Since the MDLs for these elements were not determined using an extended curve, the occurrence of J-flagged results for some of these analytes in the method blank may be a consequence.

Internal Standard Response

Internal standard responses for all standards, samples, and quality control samples were method-compliant.

Laboratory Control Sample

All Laboratory Control Sample recoveries were in control.

Matrix Spike

Sample '71SS12B' was fortified with all target analytes. The majority of recoveries and RPDs were in control (including those not-qualified because the unspiked sample concentration was greater than or equal to four times the amount spiked). The exceptions were one or both recoveries for Calcium and Chromium; those recoveries were less than the lower control limit. See the MS/MSD summaries and Statements of Data Qualification for details.

Serial Dilutions and Post-Digestion Spikes

Serial dilution and post-digestion spike (PDS) analysis was performed on the sample employed for MS/MSD analysis; all values were in control with the exception of Manganese.

Sample Results

See Section E.

Statements of Data Qualification

See Narrative Attachment 2.

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Quality Control Results – ICP/MS Metals

Calibration

All instrument calibrations and continuing calibrations were method-compliant. Note: instrument reports for ICPMS include the listing of initial calibration correlation coefficients and internal standard recoveries; those values may either be imbedded with raw data from each run or included as a summary (also within the instrument printout).

Method Blanks

No target elements were detected at or above the RL. Depending upon the method blank, there were J-flagged detections for Copper, Nickel, Vanadium and/or Antimony.

Internal Standard Response

Internal standard responses for all standards, samples, and quality control samples were method-compliant.

Laboratory Control Sample

All Laboratory Control Sample recoveries were in control.

Matrix Spike

Sample '71SS12B' was fortified with all target analytes. All recoveries and RPDs were in control with the exception of one or both recoveries for Cobalt. See the MS/MSD summaries and Statements of Data Qualification for details.

Serial Dilutions and Post-Digestion Spikes

Serial dilution and post-digestion spike (PDS) analysis was performed on the sample employed for MS/MSD analysis; all values were in control with the exception of Selenium.

Sample Results

See Section F.

Statements of Data Qualification

See Narrative Attachment 2.

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Quality Control Results – Mercury (CVAA)

Calibration

Instrument calibration and continuing calibrations were method-compliant.

Method Blanks

Mercury was not detected at or above the Reporting Limit (RL), however, it was detected at a J-flagged level in the soil method blank.

Laboratory Control Samples

The Laboratory Control Sample recoveries were in control.

Matrix Spikes

Sample '71SS12B' was fortified. Both recoveries and RPD were in control.

Serial Dilutions and Post-Digestion Spikes

Not applicable.

Sample Results

See Section G.

Statements of Data Qualification

There were no statements generated.

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Quality Control Results – Wet Chemistry (Percent Solids)

Calibration

Instrument (balance) calibrations were in control.

Method Blanks

The method blank was in control.

Laboratory Control Samples

Not applicable.

Matrix Spikes

No applicable.

Duplicate Analysis

Samples '71SS12B' and '40SS9' were analyzed in duplicate; both RPDs were in control.

Sample Results

Please see Section H of the data package.

Statements of Data Qualification

There were no statements generated.

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Data Review and Approval

All data was peer-reviewed by a second analyst and then by appropriate data management staff against laboratory quality control requirements and project specifications; it was then reviewed and approved by the group supervisor/manager prior to further review by the project chemist. All reviews were documented.

Data Deliverables

The data deliverables, both hardcopy and electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD has been issued separate from this hardcopy report.

Walt Roudebush, Project Chemist

5/22/06
Date

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#4

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Chain of Custody Record

COC No. 113683

Page ____ of ____

For Lab Use Only
Cart:
VOA Rack/Tray:
Receipt Log No.:
Project Chemist: LSYR
Laboratory Project No.: E

Client Name: VNS
Address: 5540 Falmouth St Ste 201 Richmond VA 23230
Phone: 804 965-9008
Fax:

Project Name: 59th Fourteen Acres
Client Project No. / P.O. No.: 116566628.10000
Invoice To: ☐ Client ☐ Other (comments)
Contact/Report To:

Analyses Requested

Tot. PCB, TAL Metals, TAL Inorganics

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Container Type (corresponds to Containers Packing List): 1 1 1 1 1 1 1

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted									Total	Sample Comments
01	So		01	715B14A	1088	4/20/06	1650		x	S	x	x		2	1						
01	So		02	715B14B		4/20/06	1655		x	S	x	x		2	1						
01	So		03	715B14C		4/21/06	1120		x	S	x	x		2	1						
01	So		04	715B13A		4/20/06	1530		x	S	x	x		2	1						
01	So		05	715B13B		4/20/06	1615		x	S	x	x		2	1						
01	So		06	715B13C		4/20/06	1670		x	S	x	x		2	1						
01	So		07	DUP 2		4.20.06 KZ	—		x	x	x	x		2	1						
			08								added per client (VNS)										
			09																		
			10																		

Sampled By (print): JSlaugh
Sampler's Signature:
Company: VNS

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	4/24/06	1400						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Ken Ziegler	4/24/06	9:35

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(1)

#3

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Chain of Custody Record

COC No. 113682

Page ____ of ____

For Lab Use Only
Cart #2
VOA Rack/Tray
Receipt Log No.
Project Chemist
Laboratory Project No.

Client Name: URS
Address: 5510 Falmouth 2nd Fl
Richmond VA
Phone 804 965-7000
Fax

Project Name: SSP Fuel Area
Client Project No. / P.O. No.: 46566281 0003
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Lee Ann Mercer

Analyses Requested

TCL PCB
TAL metals
TPH DRO/GRO

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)										Total	Sample Comments
											Number of Containers Submitted											
01	So	08	1	7155118	1346	4/24/06	1800				X	X	X		2	1						X added (SRC)
01	So	09	2	7155138		4/20/06	1915				X	X	X		2	1						X added (URS)
01	So	13 (MS)	3	7155128		4/20/06	1370				X	X	X		0	0						X added (URS)
01	So	10 (MSD)	4	7158128		4/20/06	1715				X	X	X		2	1						
02	So	11	5	7158128		4/20/06	1730				X	X	X		2	1						
01	So	12	6	7158128		4/20/06	1745				X	X	X		2	1						
			7	7155128MS		"	1330								2	1						
			8	7155128MSD		"	1330								0	0						
			9																			
			10																			

Sampled By (print): JSpaans
Sampler's Signature:
Company: URS

How Shipped? Hand Carrier Fedex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	4/22/06	1400						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Ron Zielsdorf	4/24/06	0835

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#7

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COC No. 113687

Page ____ of ____

For Lab Use Only
Cart #2 bottom
VOA Rack/Tray
Receipt Log No.
Project Chemist
Laboratory Project No. E

Client Name: URS
Address: 5540 Falmouth St
Richmond VA 23230
Phone: 804 965-9610
Fax:

Project Name: SSD Fort Pickett
Client Project No. / P.O. No.: 11556218.10001
Invoice To: ☑ Client ☐ Other (comments)
Contact/Report To: Lee Ann Mandle

Analyses Requested

Tolcd TAL Metals TMDL Hg

Container Type (correspond to Container Packing List)
Number of Containers Submitted

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Total	Sample Comments
01	SO	14	1	715B15A	TM 0973	4.21.06	1015		✓			
01	SO	15	2	715B15B		4.21.06	1030		✓			
01	SO	16	3	715B15C			1045		✓			
01	SO	17	4	715B16A			930		✓			
01	SO	18	5	715B16B			945		✓			
01	SO	19	6	715B16C			1000		✓			
03	SO	20	7	Dup-3			—		✓			
			8									
			9									
			10									

Sampled By (print): J. Sloan
Sampler's Signature:
Company: URS

How Shipped? Hand Carrier: Fed Ex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	4/20/06	1400						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Ziegler	4/24/06	835

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#1

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COC No. 113685

Page 1 of 2

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Cart #2
VOA Rack/Tray 520 R - Vol 501
Receipt Log No. 11-1
Project Checklist USR
Laboratory Project No. E

107G

Client Name: URS
Address: 5540 Falmouth St Ste 201 Richmond VA 23230
Phone: 804 965 9000
Fax:

Project Name: SSA Former Ammo Plant
Client Project No. / P.O. No.: 11155628.10000
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Lee Anne Mandt

Analyses Requested

Container Type (corresponds to Container Packing List): 17 | 1 Liter | 250 Glass

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Task Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted		Total	Sample Comments
04														
05	SO	21	1	40559	0902	4/24/06	1500				X	1		
			2	40559 MS			1500				X	0		
			3	40559 MSD			1500				X	0		
05	SO	22	4	Dup-1			-				X	1		
06	SO	23	5	40517			1515				X	1		
06	SO	24	6	40558			1520				X	1		
06	SO	25	7	40516			1530				X	1		
06	SO	26	8	40515			1535				X	1		
06	SO	27	9	40557			1545				X	1		
06	SO	28	10	40514			1550				X	1		

Sampled By (print): J Spacy Lee
Sampler's Signature:
Company: URS

How Shipped? Hand Carrier Fedex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	4/27/06	1410						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Ziegler	4/28/06	0835

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#2

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Chain of Custody Record

COC No. 113686

Page 2 of 3

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Cart 2
VOA Rack/Tray
Receipt Log No. 11-1
Project Chemist WJR
Laboratory Project No. E

Client Name: VRS
Address: 5540 Edwards Mill Rd
Richmond VA 23231
Phone: 804 915-7000
Fax:

Project Name: 551 Rutherfordton
Client Project No. / P.O. No.: 11556028.1000
Invoice To: [X] Client [ ] Other (comments)
Contact/Report To: LeeAnn Monk

Analyses Requested

Container Type (corresponds to Container Packing List): Tedlar 250mL Glass

Preservatives: A NONE pH~7; B HNO_3 pH<2; C H_2SO_4 pH<2; D 1+1 HCl pH<2; E NaOH pH>12; F ZnAc/NaOH pH>9; G MeOH; H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted										Total	Sample Comments
06 8750		29	1	40556	0902	4/21	1555			SO	H	1										
06 8750		30	2	405518			1600				H	1										
06 8750		31	3	405510			1620				H	1										
06 8750		32	4	405511			1630				B	1										
05 8260		33	5	Dup-5			-				H	1										
06 8750		34	6	405512			1645				B	1										
06 8750		35	7	405513		4/21 KZ	1650			SO	H	1										
			8							(WT)												
			9																			
			10																			

Sampled By (print): J Stanley
Sampler's Signature:
Company: VRS

How Shipped? Hand Carrier Fedex
Tracking No.

1. Relinquished By: Date 4/22/06 Time 1410
1. Received By: Date Time

Comments

2. Relinquished By: Date Time
2. Received By: Date Time

3. Relinquished By: Date Time
3. Received For Lab By: Kim Ziegler Date 4/24/06 Time 8:35

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#5

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Chain of Custody Record

COC No. 113684

Page ____ of ____

For Lab Use Only
Cart #2
VOA Rack/Tray 107G
Receipt Log No.
Project Chemist
Laboratory Project No. E

Client Name: VRS
Address: 5540 Falmouth St
Richmond VA 23230
Phone 804-965-9000
Fax

Project Name: 551 Five Study
Client Project No. / P.O. No. 1165662.00.00
Invoice To: ☑ Client ☐ Other (comments)
Contact/Report To: Lee Ann Monroe

Analyses Requested

PCBs TAL Metals TAL Grade TAL 1-11

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted									Total	Sample Comments
07 08	Ub		1	E98K71	TM 1383	4/2/06	1200		A	W	V	∝	∝		2	4	1					
			2																			
			3																			
			4																			
			5																			
			6																			
			7																			
			8																			
			9																			
			10																			

Sampled By (print) Sample
Sampler's Signature
Company UM

How Shipped? Hand Carrier Fed Ex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	4/22/06	1400						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Ziegler	4/24/06	8:55

TriMatrixCOC -- COC WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

(6)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING NON-CONFORMANCE REPORT

Client		Project-Submittal No.
URS		E
Receipt Log No.	Completed By (initials/date)	Project Chemist
11-1	KZ 4-24-06	WOR

List non-conformance issues associated with this submittal in the chart below/left. Identify discrepancies between the COC and sample tags in the chart below/right. Add comments as needed. Give to Project Chemist for immediate action.

COC ID No.	Line No.	Type of Problem: Discrepancy	Missing Container	Broken Container	Label Missing/ Incomplete	Label Illegible	Low Volume	Inappropriate Container	Headspace	Not Listed on COC	Preservation	COC: Sample Field ID	COC: Date Sampled	COC: Time Sampled	COC: Container Type	COC: Qty	Sample Tag: Sample Field ID	Sample Tag: Date Sampled	Sample Tag: Time Sampled	Sample Tag: Container Type	Sample Tag: Qty	LIMS Qualifiers entered for this sample
113685	4	✓										Dup 1			17	1	Dup 4			17	1	
~~113682~~ 113683	~~PB~~ ✓											~~7158~~ 7155 12B			17 19	2 1	~~7158~~ 7155 12B			17 19	2 0	
113683	7	✓																				
113683	7	✓																				
113682	2											NO analyses requested										

Comments:

TM 1373 – Aver. Sample Temp. 8.3°C – Tb 10.1°C

TM 0973 – Aver. Sample Temp: 12.9°C – Tb 12.8°C

113683 Line 7, sample date missing, added per Sample Tag

" " NO Analyses requested

113685 Line 4 Assume Dup-1 given number of remaining dup samples received. Also, no sample dates listed on COC, no matrix – added per sample tag

Project Chemist (initials/date): WOR 4/24/06

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-275 **Fraction:** PCB Congeners

Lab: Paradigm Analytical Laboratories **Project Name:** Radford_SWMU 40/71

Reviewer: RA **Date:** July 14, 2006

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Interim Guidance for the Validation of Data generated Using Method 1668 Toxic, Dioxin-like PCB Data.

Major Anomalies: None.

Minor Anomalies: Samples arrived at 12.8 °C at the laboratory. No data qualifying action was taken based on professional judgment since these were soil samples and the temperature was not above the ambient temperature.

The method blank displayed positive detections for several congeners. Positive associated field sample results less than five times the method blank concentrations were flagged "B,z".

Sample 40SS9 displayed detections for several congeners that exceeded the calibration range of the instrument and were flagged "E" by the laboratory. These results were flagged "J,q."

Both samples displayed detections for several congeners that were flagged "K" by the laboratory. It was confirmed by the laboratory that these were estimated maximum possible concentrations (EMPCs). These results were changed to non-detects unless previously flagged for method blank contamination.

Correctable Anomalies: None.

Comments: It should be noted that no field blanks were collected for this set of samples. It should also be noted that samples 71SS12B and 40SS9 were incorrectly identified as 715512B and 41559, respectively, by the laboratory. Correction was made on the result forms.

All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Rayan

Paradigm Analytical Laboratories

Cust Proj ID: SSP Further Action
Client Name: URS

G296-275

Due Date: 2006-05-15 17:00:00
Login Date: 2006-04-24 11:31:35

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G296-275-1	A	715512B	STD	2006-04-20 18:45:00	2006-04-24	2006-05-15	Soil	W2	Full	1668A	LG::REVW
G296-275-2	A	41559	STD	2006-04-21 15:00:00	2006-04-24	2006-05-15	Soil	W2	Full	1668A	LG::REVW

SGS

Data Qualifiers

B	Analyte was detected in the Lab Method Blank (LMB) at a concentration greater than 20pg/L or 5 pg/g, and the concentration in the associated sample is less than 10 times the LMB concentration.
U	Identifies a compound as not being detected.
C	Data refers to the first of the co-eluting congeners.
Cx	Data is listed under the lowest numerical congener number in the group where 'x' references the lowest congener.
EDL	Estimated Detection Limit
T	Retention time shift.
ppt	Parts-per-trillion (pg/g; ng/L)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A	Amount detected is less than the Lower Calibration Limit.
J	Amount detected is less than the Lower Calibration Limit.
K	Data is being reported with a failing ratio and should be considered as an estimated value.
E	Amount detected is greater than the Upper Calibration Limit.
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).
Q	Indicates the presence of a quantitative interference. This situation generally results in an underestimation of the affected analyte(s).
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).
#	Outside quality control limits
*	See case narrative

SGS

Table 1: Toxic Equivalency Factors

Analyte	World Health Organization	International-89	MADEP
2,3,7,8-TCDD	1	1	1
1,2,3,7,8-PeCDD	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.1
OCDD	0.0001	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.1
OCDF	0.0001	0.001	0.001

PCB Congener Results by Method 1668A | **EPA FORM 1** | ***Paradigm Analytical Labs***

Client Project ID: **SSP Further Action**

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Client Sample ID
~~715512B~~

715512B RA 7/14/06

Laboratory Information			**Sample Information**		
Lab Project ID:	G296-275		Matrix:	Soil	
Lab Sample ID:	G296-275-1B		Amount:	16.09	g
Dilution factor:	1		pH:	NA	
Collection Date/Time:	20-Apr-06	18:45	Solids/Basis:	67.1	/ Dry
Receipt Date/Time:	24-Apr-06	09:10	QC Batch ID:	WG13016 / 13016	
Extraction Date:	07-May-06		Filename:	b26may06b-10	
Analysis Date/Time:	27-May-06	01:41	ConCal:	b26may06b-1	
			RRT Std:	b26may06b-2	
			Initial Cal:	m1668a-b010906d	

No.	Analyte Structure	-LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT	#	Ratio	#	Qualifier	
1	2	-MoCB		1.16	0.193	6:45		2.40	#	K	B,Z
2	3	-MoCB		0.789	0.202	8:03		2.21	#	J K	↓
3	4	-MoCB		0.898	0.189	8:11		2.64	#	J K	B,Z
4	2,2'	-DiCB		2.65	1.15	8:21		1.33			
5	2,3	-DiCB		ND	0.639					U	
6	2,3'	-DiCB		1.86	0.579	10:02		1.73			
7	2,4	-DiCB		ND	0.533					U	
8	2,4'	-DiCB		4.07	0.511	10:22		1.34			B,Z
9	2,5	-DiCB		ND	0.622					U	
10	2,6	-DiCB		ND	0.828					U	
11	3,3'	-DiCB		8.66	0.572	12:18		1.53		B	B,Z
12	3,4	-DiCB	C	ND	0.546					U	
13	3,4'	-DiCB	C12								
14	3,5	-DiCB		ND	0.592					U	
15	4,4'	-DiCB		2.11	0.581	12:50		1.30	#	K	B,Z
16	2,2',3	-TrCB		1.95	0.464	12:49		1.03			B,Z
17	2,2',4	-TrCB		2.22	0.448	12:24		0.97			↓
18	2,2',5	-TrCB	C	4.52	0.409	12:03		1.00			B,Z
19	2,2',6	-TrCB		0.541	0.336	10:37		1.18		J	
20	2,3,3'	-TrCB	C	6.02	0.280	15:34		1.08			B,Z
21	2,3,4	-TrCB	C	2.78	0.274	15:48		1.13			↓
22	2,3,4'	-TrCB		2.30	0.290	16:11		0.96			B,Z
23	2,3,5	-TrCB		ND	0.285					U	
24	2,3,6	-TrCB		ND	0.316					U	
25	2,3',4	-TrCB		0.671	0.248	14:59		1.27	#	J K	B,Z
26	2,3',5	-TrCB	C	1.85	0.294	14:45		0.99		J	B,Z
27	2,3',6	-TrCB		0.502	0.322	12:35		0.95		J	
28	2,4,4'	-TrCB	C20								
29	2,4,5	-TrCB	C26								
30	2,4,6	-TrCB	C18								B,Z
31	2,4',5	-TrCB		4.95	0.276	15:16		1.07			B,Z
32	2,4',6	-TrCB		1.35	0.299	13:14		1.28	#	K	
33	2,3',4'	-TrCB	C21								
34	2,3',5'	-TrCB		ND	0.326					U	
35	3,3',4	-TrCB		ND	0.332					U	
36	3,3',5	-TrCB		ND	0.319					U	
37	3,4,4'	-TrCB		1.94	0.444	19:43		1.26	#	K	B,Z
38	3,4,5	-TrCB		ND	0.345					U	
39	3,4',5	-TrCB		ND	0.299					U	
40	2,2',3,3'	-TeCB	C	1.72	0.488	19:32		0.70		J	B,Z
41	2,2',3,4	-TeCB		ND	0.758					U	
42	2,2',3,4'	-TeCB		1.23	0.576	19:00		0.80			
43	2,2',3,5	-TeCB		ND	0.650					U	
44	2,2',3,5'	-TeCB	C	7.72	0.549	18:25		0.81			B,Z

PCB Congener Results by Method 1668A *Paradigm Analytical Labs*

Client Project ID: SSP Further Action

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Client Sample ID
~~715512B~~

715512B RA

No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT	Ratio #	Qualifier	
45	2,2',3,6 -TeCB	C	1.62	0.556	15:39	0.70	J	B,Z
46	2,2',3,6' -TeCB		ND	0.575			U	
47	2,2',4,4' -TeCB	C44						
48	2,2',4,5 -TeCB		1.02	0.566	18:10	0.78		
49	2,2',4,5' -TeCB	C	4.31	0.514	17:52	0.77		B,Z
50	2,2',4,6 -TeCB	C	1.29	0.568	15:01	1.28 #	J K	B,Z
51	2,2',4,6' -TeCB	C45						
52	2,2',5,5' -TeCB		18.7	0.637	17:22	0.82	B	B,Z
53	2,2',5,6' -TeCB	C50						
54	2,2',6,6' -TeCB		ND	0.236			U	
55	2,3,3',4 -TeCB		ND	0.298			U	
56	2,3,3',4' -TeCB		1.67	0.310	23:57	0.85		B,Z
57	2,3,3',5 -TeCB		ND	0.328			U	
58	2,3,3',5' -TeCB		ND	0.303			U	
59	2,3,3',6 -TeCB	C	ND	0.453			U	
60	2,3,4,4' -TeCB		0.800	0.290	24:11	1.05 #	J K	B,Z
61	2,3,4,5 -TeCB	C	10.7	0.310	22:44	0.71		B,Z
62	2,3,4,6 -TeCB	C59						
63	2,3,4',5 -TeCB		ND	0.307			U	
64	2,3,4',6 -TeCB		2.46	0.409	19:46	0.61 #	K	B,Z
65	2,3,5,6 -TeCB	C44						
66	2,3',4,4' -TeCB		3.91	0.303	23:05	0.74		B,Z
67	2,3',4,5 -TeCB		ND	0.270			U	
68	2,3',4,5' -TeCB		ND	0.287			U	
69	2,3',4,6 -TeCB	C49						
70	2,3',4',5 -TeCB	C61						
71	2,3',4',6 -TeCB	C40						
72	2,3',5,5' -TeCB		ND	0.316			U	
73	2,3',5',6 -TeCB		ND	0.431			U	
74	2,4,4',5 -TeCB	C61						
75	2,4,4',6 -TeCB	C59						
76	2,3',4',5' -TeCB	C61						
77	3,3',4,4' -TeCB		0.478	0.310	28:43	0.66	J	
78	3,3',4,5 -TeCB		ND	0.303			U	
79	3,3',4,5' -TeCB		~~0.493~~	0.257	26:43	0.63 #	J K	
80	3,3',5,5' -TeCB		ND	0.256			U	
81	3,4,4',5 -TeCB		ND	0.321			U	
82	2,2',3,3',4 -PeCB		1.91	0.778	28:15	1.44		B,Z
83	2,2',3,3',5 -PeCB		0.961	0.867	25:51	2.07 #	K	B,Z
84	2,2',3,3',6 -PeCB		4.65	0.785	23:00	1.32		B,Z
85	2,2',3,4,4' -PeCB	C	2.61	0.556	27:35	1.75		B,Z
86	2,2',3,4,5 -PeCB	C	13.5	0.601	26:41	1.68		B,Z
87	2,2',3,4,5' -PeCB	C86						
88	2,2',3,4,6 -PeCB	C	2.42	0.743	22:42	1.88 #	K	B,Z
89	2,2',3,4,6' -PeCB		ND	0.791			U	
90	2,2',3,4',5 -PeCB	C	12.6	0.613	25:15	1.58		B,Z
91	2,2',3,4',6 -PeCB	C88						
92	2,2',3,5,5' -PeCB		2.15	0.729	24:30	1.29 #	K	B,Z
93	2,2',3,5,6 -PeCB	C	ND	0.721			U	
94	2,2',3,5,6' -PeCB		ND	0.777			U	
95	2,2',3,5',6 -PeCB		13.0	0.750	21:41	1.47	B	B,Z
96	2,2',3,6,6' -PeCB		ND	0.713			U	
97	2,2',3,4',5' -PeCB	C86						
98	2,2',3,4',6' -PeCB	C	ND	0.731			U	
99	2,2',4,4',5 -PeCB		5.27	0.567	25:59	1.44		B,Z

PCB Congener Results by Method 1668A *Paradigm Analytical Labs*

Client Project ID: SSP Further Action

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Client Sample ID
~~715512B~~

715512B RA

No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT #	Ratio #	Qualifier	
100	2,2',4,4',6 -PeCB	C93						
101	2,2',4,5,5' -PeCB	C90						
102	2,2',4,5,6' -PeCB	C98						
103	2,2',4,5',6 -PeCB		ND	0.717			U	
104	2,2',4,6,6' -PeCB		ND	0.357			U	
105	2,3,3',4,4' -PeCB		6.04	0.640	33:33	1.55	B	B,Z
106	2,3,3',4,5 -PeCB		ND ND	0.605			U	
107	2,3,3',4',5 -PeCB	C	~~0.682~~	0.616	30:56	1.07 #	J K	
108	2,3,3',4,5' -PeCB	C86						
109	2,3,3',4,6 -PeCB		0.832	0.542	31:15	1.71	J	
110	2,3,3',4',6 -PeCB	C	17.5	0.516	27:49	1.62	B	B,Z
111	2,3,3',5,5' -PeCB		ND	0.492			U	
112	2,3,3',5,6 -PeCB		0.587	0.504	26:06	1.59	J	
113	2,3,3',5',6 -PeCB	C90						
114	2,3,4,4',5 -PeCB		ND	0.636			U	
115	2,3,4,4',6 -PeCB	C110						
116	2,3,4,5,6 -PeCB	C85						
117	2,3,4',5,6 -PeCB	C85						
118	2,3',4,4',5 -PeCB		12.9	0.602	31:53	1.57	B	B,Z
119	2,3',4,4',6 -PeCB	C86						
120	2,3',4,5,5' -PeCB		ND	0.482			U	
121	2,3',4,5',6 -PeCB		ND	0.530			U	
122	2,3,3',4',5' -PeCB		ND	0.642			U	
123	2,3',4,4',5' -PeCB		ND	0.644			U	
124	2,3',4',5,5' -PeCB	C107						
125	2,3',4',5',6 -PeCB	C86						
126	3,3',4,4',5 -PeCB		ND	0.652			U	
127	3,3',4,5,5' -PeCB		ND	0.587			U	
128	2,2',3,3',4,4' -HxCB	C	2.83	0.767	38:11	1.17		B,Z
129	2,2',3,3',4,5 -HxCB	C	15.3	0.826	36:21	1.16	B	B,Z
130	2,2',3,3',4,5' -HxCB		ND	0.978			U	
131	2,2',3,3',4,6 -HxCB		ND	0.933			U	
132	2,2',3,3',4,6' -HxCB		5.03	0.894	32:02	1.26		B,Z
133	2,2',3,3',5,5' -HxCB		ND	0.893			U	
134	2,2',3,3',5,6 -HxCB		ND	0.984			U	
135	2,2',3,3',5,6' -HxCB	C	3.35	0.843	29:04	1.11		B,Z
136	2,2',3,3',6,6' -HxCB		1.62	0.673	25:54	1.16		B,Z
137	2,2',3,4,4',5 -HxCB		1.08	0.833	35:42	1.18		B,Z
138	2,2',3,4,4',5' -HxCB	C129						
139	2,2',3,4,4',6 -HxCB	C	ND	0.813			U	
140	2,2',3,4,4',6' -HxCB	C139						
141	2,2',3,4,5,5' -HxCB		1.83	0.815	34:50	0.99 #	K	B,Z
142	2,2',3,4,5,6 -HxCB		ND	0.957			U	
143	2,2',3,4,5,6' -HxCB		ND	0.916			U	
144	2,2',3,4,5',6 -HxCB		ND	0.829			U	
145	2,2',3,4,6,6' -HxCB		ND	0.674			U	
146	2,2',3,4',5,5' -HxCB		1.55	0.742	33:39	0.99 #	K	B,Z
147	2,2',3,4',5,6 -HxCB	C	8.39	0.800	30:18	1.35		B,Z
148	2,2',3,4',5,6' -HxCB		ND	0.879			U	
149	2,2',3,4',5',6 -HxCB	C147						
150	2,2',3,4',6,6' -HxCB		ND	0.618			U	
151	2,2',3,5,5',6 -HxCB	C135						
152	2,2',3,5,6,6' -HxCB		ND	0.676			U	
153	2,2',4,4',5,5' -HxCB	C	8.37	0.689	34:32	1.27		B,Z
154	2,2',4,4',5,6' -HxCB		ND	0.703			U	

PCB Congener Results by Method 1668A — ***Paradigm Analytical Labs***

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Client Sample ID
~~Z15512B~~

715512B RA

No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT #	Ratio #	Qualifier	
155	2,2',4,4',6,6' -HxCB		ND	0.471			U	
156	2,3,3',4,4',5 -HxCB	C	2.16	0.588	42:31	1.31		B,Z
157	2,3,3',4,4',5' -HxCB	C156						
158	2,3,3',4,4',6 -HxCB		1.52	0.603	36:54	1.38		B,Z
159	2,3,3',4,5,5' -HxCB		ND	0.559			U	
160	2,3,3',4,5,6 -HxCB		ND	0.634			U	
161	2,3,3',4,5',6 -HxCB		ND	0.670			U	
162	2,3,3',4',5,5' -HxCB		ND	0.547			U	
163	2,3,3',4',5,6 -HxCB	C129						
164	2,3,3',4',5',6 -HxCB		0.965	0.644	35:54	1.04 #	K	B,Z
165	2,3,3',5,5',6 -HxCB		ND	0.686			U	
166	2,3,4,4',5,6 -HxCB	C128						
167	2,3',4,4',5,5' -HxCB		0.602	0.518	40:47	1.09	J	B,Z
168	2,3',4,4',5',6 -HxCB	C153						
169	3,3',4,4',5,5' -HxCB		ND	0.497			U	
170	2,2',3,3',4,4',5 -HpCB		ND 2.46	0.672	46:35	1.21 #	K	B,Z
171	2,2',3,3',4,4',6 -HpCB	C	ND ~~0.941~~	0.721	41:12	1.35 #	J K	
172	2,2',3,3',4,5,5' -HpCB		ND	0.711			U	
173	2,2',3,3',4,5,6 -HpCB	C171						
174	2,2',3,3',4,5,6' -HpCB		ND ~~1.84~~	0.635	39:37	1.32 #	K	
175	2,2',3,3',4,5',6 -HpCB		ND	0.634			U	
176	2,2',3,3',4,6,6' -HpCB		ND	0.490			U	
177	2,2',3,3',4,5',6' -HpCB		ND ~~1.09~~	0.702	40:16	0.78 #	K	
178	2,2',3,3',5,5',6 -HpCB		ND	0.660			U	
179	2,2',3,3',5,6,6' -HpCB		0.735	0.482	33:05	0.91	J	
180	2,2',3,4,4',5,5' -HpCB	C	3.75	0.558	44:40	1.10		B,Z
181	2,2',3,4,4',5,6 -HpCB		ND	0.612			U	
182	2,2',3,4,4',5,6' -HpCB		ND	0.607			U	
183	2,2',3,4,4',5',6 -HpCB	C	ND ~~0.869~~	0.617	39:17	1.26 #	J K	
184	2,2',3,4,4',6,6' -HpCB		ND	0.440			U	
185	2,2',3,4,5,5',6 -HpCB	C183						
186	2,2',3,4,5,6,6' -HpCB		ND	0.481			U	
187	2,2',3,4',5,5',6 -HpCB		1.83	0.565	38:20	1.29 #	K	B,Z
188	2,2',3,4',5,6,6' -HpCB		ND	0.478			U	
189	2,3,3',4,4',5,5' -HpCB		ND	0.488			U	
190	2,3,3',4,4',5,6 -HpCB		ND ~~0.546~~	0.519	47:24	1.40 #	J K	
191	2,3,3',4,4',5',6 -HpCB		ND	0.527			U	
192	2,3,3',4,5,5',6 -HpCB		ND	0.531			U	
193	2,3,3',4',5,5',6 -HpCB	C180						
194	2,2',3,3',4,4',5,5' -OcCB		0.902	0.873	54:47	1.00	J	
195	2,2',3,3',4,4',5,6 -OcCB		ND	0.963			U	
196	2,2',3,3',4,4',5,6' -OcCB		ND	1.16			U	
197	2,2',3,3',4,4',6,6' -OcCB	C	ND	0.941			U	
198	2,2',3,3',4,5,5',6 -OcCB	C	1.21	1.14	47:43	1.02	J	
199	2,2',3,3',4,5,5',6' -OcCB	C198						
200	2,2',3,3',4,5,6,6' -OcCB	C197						
201	2,2',3,3',4,5',6,6' -OcCB		ND	0.958			U	
202	2,2',3,3',5,5',6,6' -OcCB		ND	0.921			U	
203	2,2',3,4,4',5,5',6 -OcCB		ND	1.02			U	
204	2,2',3,4,4',5,6,6' -OcCB		ND	0.999			U	
205	2,3,3',4,4',5,5',6 -OcCB		ND	0.649			U	
206	2,2',3,3',4,4',5,5',6 -NoCB		ND	0.925			U	
207	2,2',3,3',4,4',5,6,6' -NoCB		ND	0.937			U	
208	2,2',3,3',4,5,5',6,6' -NoCB		ND	0.876			U	
209	2,2',3,3',4,4',5,5',6,6' -DeCB		ND	0.698			U	

Analyzed By: JMP

Date: 06-02-06

Reviewed By: [signature]

Date: 6/14/06

PCB Congener Results by Method 1668A | **EPA FORM 2** | ***Paradigm Analytical Labs***

Client Project ID: SSP Further Action

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Client Sample ID
~~715512B~~

715512B RA

Recovery Information

No.	Labeled Standards Structure -LOC	CARP	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards					(15-150%)			
1L	13C-2 -MoCB		2.00	0.630	31.5	6:44	3.23	
3L	13C-4 -MoCB		2.00	0.784	39.2	8:10	3.18	
					(25-150%)			
4L	13C-2,2' -DiCB		2.00	0.546	27.3	8:20	1.65	
15L	13C-4,4' -DiCB		2.00	0.844	42.2	12:50	1.58	
19L	13C-2,2',6 -TrCB		2.00	0.594	29.7	10:35	1.07	
37L	13C-3,4,4' -TrCB		2.00	0.938	46.9	19:42	1.05	
54L	13C-2,2',6,6' -TeCB		2.00	0.532	26.6	13:06	0.84	
77L	13C-3,3',4,4' -TeCB		2.00	0.820	41.0	28:42	0.78	
81L	13C-3,4,4',5 -TeCB		2.00	0.800	40.0	27:56	0.81	
104L	13C-2,2',4,6,6' -PeCB		2.00	0.814	40.7	18:21	1.63	
105L	13C-2,3,3',4,4' -PeCB		2.00	0.893	44.6	33:31	1.59	
114L	13C-2,3,4,4',5 -PeCB		2.00	0.817	40.8	32:35	1.65	
118L	13C-2,3',4,4',5 -PeCB		2.00	0.841	42.0	31:51	1.61	
123L	13C-2,3',4,4',5' -PeCB		2.00	0.885	44.3	31:24	1.66	
126L	13C-3,3',4,4',5 -PeCB		2.00	0.906	45.3	37:59	1.67	
155L	13C-2,2',4,4',6,6' -HxCB		2.00	0.888	44.4	24:55	1.28	
156L	13C-2,3,3',4,4',5 -HxCB	C	4.00	2.04	51.1	42:31	1.31	
157L	13C-2,3,3',4,4',5' -HxCB	C156L						
167L	13C-2,3',4,4',5,5' -HxCB		2.00	1.09	54.6	40:46	1.30	
169L	13C-3,3',4,4',5,5' -HxCB		2.00	1.13	56.4	47:29	1.31	
188L	13C-2,2',3,4',5,6,6' -HpCB		2.00	0.779	39.0	32:34	1.05	
189L	13C-2,3,3',4,4',5,5' -HpCB		2.00	1.07	53.7	51:26	1.06	
202L	13C-2,2',3,3',5,5',6,6' -OcCB		2.00	0.723	36.1	40:24	0.89	
205L	13C-2,3,3',4,4',5,5',6 -OcCB		2.00	0.965	48.2	55:31	0.93	
206L	13C-2,2',3,3',4,4',5,5',6 -NoCB		2.00	0.903	45.1	58:18	0.84	
208L	13C-2,2',3,3',4,5,5',6,6' -NoCB		2.00	0.876	43.8	50:41	0.80	
209L	13C-2,2',3,3',4,4',5,5',6,6' -DeCB		2.00	0.784	39.2	60:50	1.21	
Cleanup Standards					(30-135%)			
28L	13C-2,4,4' -TrCB		2.00	0.853	42.7	15:32	1.07	
111L	13C-2,3,3',5,5' -PeCB		2.00	0.896	44.8	28:43	1.60	
178L	13C-2,2',3,3',5,5',6 -HpCB		2.00	0.925	46.2	36:58	1.09	
Injection Standards								
9L	13C-2,5 -DiCB		2.00			9:43	1.62	
52L	13C-2,2',5,5' -TeCB		2.00			17:20	0.80	
101L	13C-2,2',4,5,5' -PeCB		2.00			25:14	1.62	
138L	13C-2,2',3,4,4',5' -HxCB		2.00			36:18	1.26	
194L	13C-2,2',3,3',4,4',5,5' -OcCB		2.00			54:47	0.92	

Analyzed By: JMP Reviewed By: ASD

Date: 06-02-06 Date: 6/2/06

PCB Congener Results by Method 1668A | EPA FORM 1 | *Paradigm Analytical Labs*

Client Project ID: SSP Further Action

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Client Sample ID
~~41559~~

40559 RA

Laboratory Information			Sample Information		
Lab Project ID:	G296-275		Matrix:	Soil	
Lab Sample ID:	G296-275-2B		Amount:	15.04	g
Dilution factor:	1		pH:	NA	
Collection Date/Time:	21-Apr-06	15:00	Solids/Basis:	68.3	/ Dry
Receipt Date/Time:	24-Apr-06	09:10	QC Batch ID:	WG13016 / 13016	
Extraction Date:	07-May-06		Filename:	b26may06b-11	
Analysis Date/Time:	27-May-06	02:46	ConCal:	b26may06b-1	
			RRT Std:	b26may06b-2	
			Initial Cal:	m1668a-b010906d	

No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT	#	Ratio	#	Qualifier
1	2 -MoCB		2.33	0.215	6:47		2.92		
2	3 -MoCB		2.07	0.218	8:05		3.56		
3	4 -MoCB		2.69	0.197	8:12		3.20		
4	2,2' -DiCB		8.15	0.914	8:22		1.54		
5	2,3 -DiCB		~~0.956~~ ND	0.715	10:17		1.18	#	J K
6	2,3' -DiCB		3.99	0.647	10:03		1.34		
7	2,4 -DiCB		ND	0.596					U
8	2,4' -DiCB		14.5	0.572	10:23		1.68		
9	2,5 -DiCB		1.51	0.695	9:44		1.37		
10	2,6 -DiCB		ND	0.650					U
11	3,3' -DiCB		112	0.640	12:19		1.59		B
12	3,4 -DiCB	C	3.22	0.610	12:34		1.58		
13	3,4' -DiCB	C12							
14	3,5 -DiCB		ND	0.662					U
15	4,4' -DiCB		9.85	0.643	12:51		1.65		
16	2,2',3 -TrCB		15.0	0.461	12:49		1.11		
17	2,2',4 -TrCB		16.6	0.444	12:24		1.06		
18	2,2',5 -TrCB	C	40.0	0.406	12:04		1.13		
19	2,2',6 -TrCB		4.23	0.328	10:37		1.03		
20	2,3,3' -TrCB	C	48.2	0.278	15:32		1.11		
21	2,3,4 -TrCB	C	24.4	0.272	15:47		1.10		
22	2,3,4' -TrCB		15.5	0.288	16:11		1.04		
23	2,3,5 -TrCB		ND	0.283					U
24	2,3,6 -TrCB		~~0.798~~ ND	0.314	12:42		1.30	#	J K
25	2,3',4 -TrCB		4.97	0.246	14:59		1.05		
26	2,3',5 -TrCB	C	8.89	0.292	14:45		1.04		
27	2,3',6 -TrCB		2.55	0.319	12:35		1.13		
28	2,4,4' -TrCB	C20							
29	2,4,5 -TrCB	C26							
30	2,4,6 -TrCB	C18							
31	2,4',5 -TrCB		61.9	0.274	15:16		1.09		
32	2,4',6 -TrCB		10.5	0.297	13:14		1.09		
33	2,3',4' -TrCB	C21							
34	2,3',5' -TrCB		ND	0.324					U
35	3,3',4 -TrCB		3.17	0.286	19:14		0.98		
36	3,3',5 -TrCB		0.498	0.275	17:42		0.89		J
37	3,4,4' -TrCB		22.9	0.387	19:43		1.03		
38	3,4,5 -TrCB		ND	0.297					U
39	3,4',5 -TrCB		1.01	0.258	18:09		1.12		
40	2,2',3,3' -TeCB	C	117	0.411	19:32		0.79		
41	2,2',3,4 -TeCB		8.87	0.639	19:23		0.75		
42	2,2',3,4' -TeCB		81.3	0.485	18:59		0.81		
43	2,2',3,5 -TeCB		21.7	0.548	17:37		0.79		
44	2,2',3,5' -TeCB	C	942	0.463	18:25		0.77		

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B,Z

PCB Congener Results by Method 1668A
Client Project ID: SSP Further Action

Paradigm Analytical Labs

Client Sample ID
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40559 RA

No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT	Ratio #	Qualifier
45	2,2',3,6 -TeCB	C	22.7	0.522	15:42	0.86	
46	2,2',3,6' -TeCB		ND ~~8.60~~	0.539	15:59	0.97 #	K
47	2,2',4,4' -TeCB	C44					
48	2,2',4,5 -TeCB		36.7	0.478	18:10	0.77	
49	2,2',4,5' -TeCB	C	591	0.433	17:52	0.78	
50	2,2',4,6 -TeCB	C	50.0	0.532	15:01	0.85	
51	2,2',4,6' -TeCB	C45					
52	2,2',5,5' -TeCB		2800	0.537	17:21	0.78	
53	2,2',5,6' -TeCB	C50					
54	2,2',6,6' -TeCB		ND ~~0.226~~	0.204	13:08	1.20 #	J K
55	2,3,3',4 -TeCB		13.3	1.97	23:17	0.82	
56	2,3,3',4' -TeCB		165	2.04	23:56	0.78	
57	2,3,3',5 -TeCB		ND	2.16			U
58	2,3,3',5' -TeCB		9.45	1.99	21:48	0.70	
59	2,3,3',6 -TeCB	C	20.6	0.382	18:46	0.79	
60	2,3,4,4' -TeCB		64.0	1.91	24:11	0.78	
61	2,3,4,5 -TeCB	C	1930	2.04	22:42	0.79	
62	2,3,4,6 -TeCB	C59					
63	2,3,4',5 -TeCB		22.5	2.02	22:17	0.77	
64	2,3,4',6 -TeCB		262	0.345	19:45	0.79	
65	2,3,5,6 -TeCB	C44					
66	2,3',4,4' -TeCB		553	2.00	23:05	0.78	
67	2,3',4,5 -TeCB		5.64	1.78	22:01	0.66	
68	2,3',4,5' -TeCB		9.74	1.89	20:59	0.80	
69	2,3',4,6 -TeCB	C49					
70	2,3',4',5 -TeCB	C61					
71	2,3',4',6 -TeCB	C40					
72	2,3',5,5' -TeCB		13.0	2.08	20:40	0.80	
73	2,3',5',6 -TeCB		22.1	0.364	17:31	0.78	
74	2,4,4',5 -TeCB	C61					
75	2,4,4',6 -TeCB	C59					
76	2,3',4',5' -TeCB	C61					
77	3,3',4,4' -TeCB		47.3	2.10	28:43	0.78	
78	3,3',4,5 -TeCB		ND	2.00			U
79	3,3',4,5' -TeCB		121	1.69	26:44	0.78	
80	3,3',5,5' -TeCB		ND	1.68			U
81	3,4,4',5 -TeCB		9.51	2.12	27:57	0.87	
82	2,2',3,3',4 -PeCB		526	0.581	28:15	1.58	
83	2,2',3,3',5 -PeCB		164	0.648	25:49	1.59	
84	2,2',3,3',6 -PeCB		1220	0.586	23:00	1.60	
85	2,2',3,4,4' -PeCB	C	804	0.415	27:34	1.76	
86	2,2',3,4,5 -PeCB	C	3560	0.449	26:43	1.59	
87	2,2',3,4,5' -PeCB	C86					
88	2,2',3,4,6 -PeCB	C	599	0.555	22:42	1.58	
89	2,2',3,4,6' -PeCB		30.1	0.591	23:34	1.61	
90	2,2',3,4',5 -PeCB	C	5750	0.458	25:15	1.59	E J,Q
91	2,2',3,4',6 -PeCB	C88					
92	2,2',3,5,5' -PeCB		1130	0.545	24:31	1.59	
93	2,2',3,5,6 -PeCB	C	97.2	0.538	21:53	1.53	
94	2,2',3,5,6' -PeCB		15.0	0.581	21:09	1.64	
95	2,2',3,5',6 -PeCB		4020	0.560	21:41	1.58	E J,Q
96	2,2',3,6,6' -PeCB		22.6	1.11	18:47	1.59	
97	2,2',3,4',5' -PeCB	C86					
98	2,2',3,4',6' -PeCB	C	105	0.546	22:06	1.54	
99	2,2',4,4',5 -PeCB		2430	0.423	25:58	1.59	

PCB Congener Results by Method 1668A
Client Project ID: SSP Further Action

Paradigm Analytical Labs

Client Sample ID
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No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT #	Ratio #	Qualifier
100	2,2',4,4',6 -PeCB	C93					
101	2,2',4,5,5' -PeCB	C90					
102	2,2',4,5,6' -PeCB	C98					
103	2,2',4,5',6 -PeCB		44.3	0.536	20:53	1.65	
104	2,2',4,6,6' -PeCB		ND	0.491			U
105	2,3,3',4,4' -PeCB		2130	2.59	33:33	1.61	
106	2,3,3',4,5 -PeCB		ND	2.48			U
107	2,3,3',4',5 -PeCB	C	253	2.52	30:56	1.57	
108	2,3,3',4,5' -PeCB	C86					
109	2,3,3',4,6 -PeCB		412	2.22	31:16	1.62	
110	2,3,3',4',6 -PeCB	C	6450	0.385	27:49	1.58	E J,g
111	2,3,3',5,5' -PeCB		2.20	0.367	28:44	1.61	
112	2,3,3',5,6 -PeCB		80.7	0.377	26:08	1.59	
113	2,3,3',5',6 -PeCB	C90					
114	2,3,4,4',5 -PeCB		110	2.69	32:37	1.66	
115	2,3,4,4',6 -PeCB	C110					
116	2,3,4,5,6 -PeCB	C85					
117	2,3,4',5,6 -PeCB	C85					
118	2,3',4,4',5 -PeCB		5410	2.52	31:53	1.60	E J,g
119	2,3',4,4',6 -PeCB	C86					
120	2,3',4,5,5' -PeCB		16.2	0.360	29:21	1.63	
121	2,3',4,5',6 -PeCB		ND ~~0.971~~	0.396	24:01	2.91 #	J K
122	2,3,3',4',5' -PeCB		61.0	2.63	32:22	1.62	
123	2,3',4,4',5' -PeCB		86.6	2.65	31:27	1.50	
124	2,3',4',5,5' -PeCB	C107					
125	2,3',4',5',6 -PeCB	C86					
126	3,3',4,4',5 -PeCB		21.9	2.76	37:59	1.52	
127	3,3',4,5,5' -PeCB		ND	2.41			U
128	2,2',3,3',4,4' -HxCB	C	1460	5.89	38:12	1.27	
129	2,2',3,3',4,5 -HxCB	C	9070	6.34	36:21	1.26	E J,g
130	2,2',3,3',4,5' -HxCB		535	7.50	35:25	1.26	
131	2,2',3,3',4,6 -HxCB		88.1	7.16	31:24	1.29	
132	2,2',3,3',4,6' -HxCB		2160	6.86	32:03	1.26	
133	2,2',3,3',5,5' -HxCB		136	6.85	32:45	1.25	
134	2,2',3,3',5,6 -HxCB		333	7.55	30:35	1.26	
135	2,2',3,3',5,6' -HxCB	C	2020	0.698	29:04	1.28	
136	2,2',3,3',6,6' -HxCB		702	0.558	25:54	1.27	
137	2,2',3,4,4',5 -HxCB		640	6.39	35:45	1.26	
138	2,2',3,4,4',5' -HxCB	C129					
139	2,2',3,4,4',6 -HxCB	C	145	6.24	31:06	1.23	
140	2,2',3,4,4',6' -HxCB	C139					
141	2,2',3,4,5,5' -HxCB		1010	6.25	34:51	1.17	
142	2,2',3,4,5,6 -HxCB		ND	7.35			U
143	2,2',3,4,5,6' -HxCB		18.1	7.03	30:44	1.25	
144	2,2',3,4,5',6 -HxCB		253	0.687	29:48	1.28	
145	2,2',3,4,6,6' -HxCB		2.19	0.558	26:17	1.24	
146	2,2',3,4',5,5' -HxCB		1170	5.69	33:40	1.27	
147	2,2',3,4',5,6 -HxCB	C	4600	6.14	30:19	1.26	E J,g
148	2,2',3,4',5,6' -HxCB		16.8	0.728	28:13	1.24	
149	2,2',3,4',5',6 -HxCB	C147					
150	2,2',3,4',6,6' -HxCB		12.2	0.512	25:26	1.27	
151	2,2',3,5,5',6 -HxCB	C135					
152	2,2',3,5,6,6' -HxCB		5.61	0.561	25:13	1.15	
153	2,2',4,4',5,5' -HxCB	C	6490	5.29	34:32	1.28	E J,g
154	2,2',4,4',5,6' -HxCB		95.8	0.582	29:23	1.26	

PCB Congener Results by Method 1668A

Client Project ID: SSP Further Action

Paradigm Analytical Labs

Client Sample ID
~~41559~~

40559 RA

No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT #	Ratio #	Qualifier
155	2,2',4,4',6,6' -HxCB		ND	0.359			U
156	2,3,3',4,4',5 -HxCB	C	1050	2.27	42:32	1.28	
157	2,3,3',4,4',5' -HxCB	C156					
158	2,3,3',4,4',6 -HxCB		778	4.62	36:54	1.26	
159	2,3,3',4,5,5' -HxCB		54.2	2.08	39:39	1.22	
160	2,3,3',4,5,6 -HxCB		ND	4.86			U
161	2,3,3',4,5',6 -HxCB		ND	5.14			U
162	2,3,3',4',5,5' -HxCB		44.8	2.04	40:08	1.26	
163	2,3,3',4',5,6 -HxCB	C129					
164	2,3,3',4',5',6 -HxCB		379	4.94	35:56	1.27	
165	2,3,3',5,5',6 -HxCB		ND	5.26			U
166	2,3,4,4',5,6 -HxCB	C128					
167	2,3',4,4',5,5' -HxCB		323	1.98	40:49	1.26	
168	2,3',4,4',5',6 -HxCB	C153					
169	3,3',4,4',5,5' -HxCB		ND	1.82			U
170	2,2',3,3',4,4',5 -HpCB		1500	1.23	46:37	1.07	
171	2,2',3,3',4,4',6 -HpCB	C	465	1.32	41:12	1.10	
172	2,2',3,3',4,5,5' -HpCB		285	1.30	43:41	1.07	
173	2,2',3,3',4,5,6 -HpCB	C171					
174	2,2',3,3',4,5,6' -HpCB		1420	1.16	39:37	1.07	
175	2,2',3,3',4,5',6 -HpCB		51.0	1.38	37:56	1.01	
176	2,2',3,3',4,6,6' -HpCB		145	1.07	34:20	1.04	
177	2,2',3,3',4,5',6' -HpCB		944	1.29	40:16	1.07	
178	2,2',3,3',5,5',6 -HpCB		324	1.44	37:00	1.05	
179	2,2',3,3',5,6,6' -HpCB		512	1.05	33:06	1.05	
180	2,2',3,4,4',5,5' -HpCB	C	2970	1.02	44:41	1.07	
181	2,2',3,4,4',5,6 -HpCB		16.3	1.12	40:49	1.21	
182	2,2',3,4,4',5,6' -HpCB	ND	~~9.78~~	1.32	38:40	1.26 #	K
183	2,2',3,4,4',5',6 -HpCB	C	674	1.13	39:17	1.06	
184	2,2',3,4,4',6,6' -HpCB		ND	0.956			U
185	2,2',3,4,5,5',6 -HpCB	C183					
186	2,2',3,4,5,6,6' -HpCB		ND	1.05			U
187	2,2',3,4',5,5',6 -HpCB		1740	1.23	38:20	1.05	
188	2,2',3,4',5,6,6' -HpCB		3.37	1.03	32:36	1.09	
189	2,3,3',4,4',5,5' -HpCB		55.9	0.875	51:30	1.06	
190	2,3,3',4,4',5,6 -HpCB		322	0.951	47:25	1.06	
191	2,3,3',4,4',5',6 -HpCB		59.1	0.965	45:14	1.08	
192	2,3,3',4,5,5',6 -HpCB		ND	0.972			U
193	2,3,3',4',5,5',6 -HpCB	C180					
194	2,2',3,3',4,4',5,5' -OcCB		520	0.982	54:52	0.91	
195	2,2',3,3',4,4',5,6 -OcCB		236	1.08	51:07	0.89	
196	2,2',3,3',4,4',5,6' -OcCB		295	0.829	48:45	0.82	
197	2,2',3,3',4,4',6,6' -OcCB	C	87.7	0.673	43:20	0.93	
198	2,2',3,3',4,5,5',6 -OcCB	C	557	0.818	47:44	0.91	
199	2,2',3,3',4,5,5',6' -OcCB	C198					
200	2,2',3,3',4,5,6,6' -OcCB	C197					
201	2,2',3,3',4,5',6,6' -OcCB		61.7	0.686	41:50	0.90	
202	2,2',3,3',5,5',6,6' -OcCB		96.3	0.683	40:27	0.90	
203	2,2',3,4,4',5,5',6 -OcCB		298	0.733	49:04	0.98	
204	2,2',3,4,4',5,6,6' -OcCB		ND	0.715			U
205	2,3,3',4,4',5,5',6 -OcCB		26.9	0.696	55:36	0.93	
206	2,2',3,3',4,4',5,5',6 -NoCB		129	1.25	58:23	0.80	
207	2,2',3,3',4,4',5,6,6' -NoCB		17.5	1.35	52:12	0.82	
208	2,2',3,3',4,5,5',6,6' -NoCB		29.9	1.34	50:45	0.80	
209	2,2',3,3',4,4',5,5',6,6' -DeCB		24.9	0.603	60:56	1.11	

Analyzed By: JMP

Date: 12-02-06

Reviewed By: [signature]

Date: 6/4/06

PCB Congener Results by Method 1668A | EPA FORM 2 | *Paradigm Analytical Labs*

Client Project ID: SSP Further Action

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Client Sample ID
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41559 RA

Recovery Information

No.	Labeled Standards Structure -LOC	CARP	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards					(15-150%)			
1L	13C-2 -MoCB		2.00	0.670	33.5	6:46	3.24	
3L	13C-4 -MoCB		2.00	0.878	43.9	8:11	3.26	
					(25-150%)			
4L	13C-2,2' -DiCB		2.00	0.610	30.5	8:22	1.66	
15L	13C-4,4' -DiCB		2.00	0.930	46.5	12:50	1.60	
19L	13C-2,2',6 -TrCB		2.00	0.649	32.5	10:36	1.05	
37L	13C-3,4,4' -TrCB		2.00	1.06	52.9	19:41	1.04	
54L	13C-2,2',6,6' -TeCB		2.00	0.587	29.4	13:07	0.86	
77L	13C-3,3',4,4' -TeCB		2.00	0.916	45.8	28:42	0.81	
81L	13C-3,4,4',5 -TeCB		2.00	0.909	45.5	27:56	0.79	
104L	13C-2,2',4,6,6' -PeCB		2.00	0.896	44.8	18:20	1.60	
105L	13C-2,3,3',4,4' -PeCB		2.00	0.969	48.4	33:31	1.64	
114L	13C-2,3,4,4',5 -PeCB		2.00	0.904	45.2	32:35	1.64	
118L	13C-2,3',4,4',5 -PeCB		2.00	0.930	46.5	31:51	1.63	
123L	13C-2,3',4,4',5' -PeCB		2.00	0.951	47.5	31:24	1.65	
126L	13C-3,3',4,4',5 -PeCB		2.00	0.965	48.2	37:59	1.66	
155L	13C-2,2',4,4',6,6' -HxCB		2.00	0.963	48.2	24:55	1.26	
156L	13C-2,3,3',4,4',5 -HxCB	C	4.00	2.04	51.1	42:31	1.29	
157L	13C-2,3,3',4,4',5' -HxCB	C156L						
167L	13C-2,3',4,4',5,5' -HxCB		2.00	1.10	54.8	40:47	1.30	
169L	13C-3,3',4,4',5,5' -HxCB		2.00	1.11	55.5	47:31	1.29	
188L	13C-2,2',3,4',5,6,6' -HpCB		2.00	0.837	41.9	32:34	1.08	
189L	13C-2,3,3',4,4',5,5' -HpCB		2.00	1.07	53.6	51:28	1.06	
202L	13C-2,2',3,3',5,5',6,6' -OcCB		2.00	0.771	38.5	40:25	0.89	
205L	13C-2,3,3',4,4',5,5',6 -OcCB		2.00	0.963	48.2	55:34	0.91	
206L	13C-2,2',3,3',4,4',5,5',6 -NoCB		2.00	0.861	43.1	58:21	0.79	
208L	13C-2,2',3,3',4,5,5',6,6' -NoCB		2.00	0.856	42.8	50:42	0.77	
209L	13C-2,2',3,3',4,4',5,5',6,6' -DeCB		2.00	0.751	37.6	60:54	1.20	
Cleanup Standards					(30-135%)			
28L	13C-2,4,4' -TrCB		2.00	1.01	50.5	15:32	1.08	
111L	13C-2,3,3',5,5' -PeCB		2.00	1.00	50.1	28:43	1.61	
178L	13C-2,2',3,3',5,5',6 -HpCB		2.00	0.969	48.4	36:59	1.05	
Injection Standards								
9L	13C-2,5 -DiCB		2.00			9:44	1.63	
52L	13C-2,2',5,5' -TeCB		2.00			17:20	0.79	
101L	13C-2,2',4,5,5' -PeCB		2.00			25:13	1.58	
138L	13C-2,2',3,4,4',5' -HxCB		2.00			36:18	1.27	
194L	13C-2,2',3,3',4,4',5,5' -OcCB		2.00			54:50	0.90	

Analyzed By: JLP Reviewed By: [signature]

Date: 06-02-06 Date: 6/22/06

DATA VALIDATION WORKSHEET

PCB Congeners

Reviewer: RA
Date: 7/14/06
DV Level: II (III) IV
Review Document:
X SW-846 X Project QAPP/SAP
X NFG Region III Draft Guidance (April 2004)

Project Name: SWMU 40/71
Project Number:
Laboratory: Paradigm
SDG No.: G2946-275
Method No.: 1668A

1.0 General: Chain-of-Custody

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	✓		

Notes: Samples arrived at 12.8°C. No action since these were soil samples. and temp was not above ambient temp.

2.0 Preservation/ Holding Times

		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 2-3 with sulfuric acid. If not, J(+)/UJ(-)		✓	
2.2	Have any technical holding times been exceeded? Recommended holding time in the Method is one year. If yes, J(+)/UJ(-). No holding time or preservation requirements are promulgated by EPA for non-water matrices), use professional judgement.		✓	

Notes: see above

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B".	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.		✓	

Notes: *If there are no field blanks, the narrative should include acaution to the user that field blanks were not available for review and any contamination due to field conditions or cross contamination could not be assessed.*
MB → several pos. hits. <5X B/T

4.0 Instrument Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/ ± 20% for analytes analyzed by isotope dilution or +/- 35% for analytes analyzed by internal std method? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
~~7~~	~~M+2/M+4~~	1.05	0.89 1.21
~~8~~	~~M+2/M+4~~	0.89	0.76 1.02
~~9~~	~~M+2/M+4~~	~~0.77~~	~~0.65 0.89~~
~~10~~	~~M+2/M+4~~	~~0.69~~	~~0.59 0.79~~

Notes:

5.0 GC/MS Performance Check		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start ~~of a 12 hour~~ and end of each analytical sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 330.9792? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Are all IPR, OPR and VER standards within the method QC limits? Results for analytes that do not meet either IPR or OPR requirements should be flagged "J"/"UJ". If analyte is not recovered for an OPR sample, results must be flagged "R" for that analyte.	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

Not in this SDG

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within the method QC limits?If no, apply J/UJ to associated targets.	✓		
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.		✓	
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.			✓
10.4	Is the signal to noise ≥ 3 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥3 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.7	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes:

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
	For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.			
	For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).			

Notes:

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported: 0			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

SGS

Case Narrative
Paradigm Project: **G296-275**

For Method: 1668A

- The submitted samples were received at a temperature of 12.8°C, which is outside of the method's acceptable temperature range of 0-6°C.
- Data meet all other QA/QC requirements.

Craig R. Tronzo 6/2/06

Craig R. Tronzo — Date
Data Validation/QA Officer

Secondary Review

W. Mike Larkins — Date
Technical Director

Or Heather Patterson 02 Jun 06

Heather Patterson — Date
Director

PCB Congener Results by Method 1668A | **EPA FORM 1** | ***Paradigm Analytical Labs***

Client Project ID: **Lab Method Blank**

Client Sample ID
LMB13016

Laboratory Information

Lab Project ID:	
Lab Sample ID:	LMB13016
Dilution factor:	1
Collection Date/Time:	
Receipt Date/Time:	
Extraction Date:	07-May-06
Analysis Date/Time:	27-May-06 00:35

Sample Information

Matrix:	Soil
Amount:	10.00 g
pH:	NA
Solids/Basis:	100 / Dry
QC Batch ID:	WG13016 / 13016
Filename:	b26may06b-9
ConCal:	b26may06b-1
RRT Std:	b26may06b-2
Initial Cal:	m1668a-b010906d

No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT	Ratio	#	Qualifier	X5=
1	2 -MoCB		0.506	0.221	6:43	1.94	#	JK	2.53
2	3 -MoCB		0.614	0.236	8:02	3.28		J	3.07
3	4 -MoCB		0.654	0.223	8:10	2.78		J	3.27
4	2,2' -DiCB		ND	1.14				U	
5	2,3 -DiCB		ND	0.585				U	
6	2,3' -DiCB		ND	0.530				U	
7	2,4 -DiCB		ND	0.488				U	
8	2,4' -DiCB		2.00	0.468	10:22	1.71			10
9	2,5 -DiCB		ND	0.569				U	
10	2,6 -DiCB		ND	0.875				U	
11	3,3' -DiCB		24.3	0.524	12:18	1.62			121.5
12	3,4 -DiCB	C	ND	0.499				U	
13	3,4' -DiCB	C12							
14	3,5 -DiCB		ND	0.542				U	
15	4,4' -DiCB		1.30	0.556	12:50	2.01	#	K	6.5
16	2,2',3 -TrCB		1.19	0.563	12:49	0.99			5.95
17	2,2',4 -TrCB		1.17	0.543	12:23	0.97			5.85
18	2,2',5 -TrCB	C	2.73	0.496	12:02	1.11			13.65
19	2,2',6 -TrCB		ND	0.399				U	
20	2,3,3' -TrCB	C	3.12	0.340	15:32	1.07			15.6
21	2,3,4 -TrCB	C	1.75	0.332	15:47	1.01		J	8.75
22	2,3,4' -TrCB		1.22	0.352	16:11	1.17			6.1
23	2,3,5 -TrCB		ND	0.346				U	
24	2,3,6 -TrCB		ND	0.383				U	
25	2,3',4 -TrCB		0.340	0.300	14:56	1.55	#	JK	1.7
26	2,3',5 -TrCB	C	0.700	0.356	14:44	1.08		J	3.5
27	2,3',6 -TrCB		ND	0.390				U	
28	2,4,4' -TrCB	C20							
29	2,4,5 -TrCB	C26							
30	2,4,6 -TrCB	C18							
31	2,4',5 -TrCB		2.77	0.334	15:16	1.21	#	K	13.85
32	2,4',6 -TrCB		0.784	0.363	13:13	1.24	#	JK	3.92
33	2,3',4' -TrCB	C21							
34	2,3',5' -TrCB		ND	0.396				U	
35	3,3',4 -TrCB		ND	0.388				U	
36	3,3',5 -TrCB		ND	0.373				U	
37	3,4,4' -TrCB		0.946	0.527	19:43	0.99		J	4.73
38	3,4,5 -TrCB		ND	0.404				U	
39	3,4',5 -TrCB		ND	0.350				U	
40	2,2',3,3' -TeCB	C	0.940	0.522	19:32	1.01	#	JK	4.7
41	2,2',3,4 -TeCB		ND	0.812				U	
42	2,2',3,4' -TeCB		ND	0.617				U	
43	2,2',3,5 -TeCB		ND	0.696				U	
44	2,2',3,5' -TeCB	C	4.17	0.588	18:25	0.74			20.85

PCB Congener Results by Method 1668A

Client Project ID: Lab Method Blank

Paradigm Analytical Labs

Client Sample ID
LMB13016

No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT	#	Ratio	#	Qualifier
45	2,2',3,6 -TeCB	C	0.840	0.627	15:39		0.93	#	J K
46	2,2',3,6' -TeCB		ND	0.648					U
47	2,2',4,4' -TeCB	C44							
48	2,2',4,5 -TeCB		ND	0.607					U
49	2,2',4,5' -TeCB	C	2.54	0.550	17:52		0.98	#	K
50	2,2',4,6 -TeCB	C	0.746	0.639	15:01		1.13	#	J K
51	2,2',4,6' -TeCB	C45							
52	2,2',5,5' -TeCB		10.6	0.683	17:22		0.73		
53	2,2',5,6' -TeCB	C50							
54	2,2',6,6' -TeCB		ND	0.240					U
55	2,3,3',4 -TeCB		ND	0.443					U
56	2,3,3',4' -TeCB		0.898	0.460	23:56		0.85		J
57	2,3,3',5 -TeCB		ND	0.488					U
58	2,3,3',5' -TeCB		ND	0.449					U
59	2,3,3',6 -TeCB	C	ND	0.485					U
60	2,3,4,4' -TeCB		0.464	0.430	24:10		0.61	#	J K
61	2,3,4,5 -TeCB	C	5.81	0.460	22:43		0.80		
62	2,3,4,6 -TeCB	C59							
63	2,3,4',5 -TeCB		ND	0.456					U
64	2,3,4',6 -TeCB		1.57	0.438	19:46		0.79		
65	2,3,5,6 -TeCB	C44							
66	2,3',4,4' -TeCB		1.91	0.450	23:05		0.76		
67	2,3',4,5 -TeCB		ND	0.401					U
68	2,3',4,5' -TeCB		ND	0.426					U
69	2,3',4,6 -TeCB	C49							
70	2,3',4',5 -TeCB	C61							
71	2,3',4',6 -TeCB	C40							
72	2,3',5,5' -TeCB		ND	0.470					U
73	2,3',5',6 -TeCB		ND	0.462					U
74	2,4,4',5 -TeCB	C61							
75	2,4,4',6 -TeCB	C59							
76	2,3',4',5' -TeCB	C61							
77	3,3',4,4' -TeCB		ND	0.474					U
78	3,3',4,5 -TeCB		ND	0.450					U
79	3,3',4,5' -TeCB		ND	0.382					U
80	3,3',5,5' -TeCB		ND	0.380					U
81	3,4,4',5 -TeCB		ND	0.490					U
82	2,2',3,3',4 -PeCB		1.63	0.704	28:14		1.55		
83	2,2',3,3',5 -PeCB		ND	0.785					U
84	2,2',3,3',6 -PeCB		2.87	0.710	22:59		1.79	#	K
85	2,2',3,4,4' -PeCB	C	1.43	0.503	27:34		1.85	#	J K
86	2,2',3,4,5 -PeCB	C	7.09	0.544	26:43		1.55		
87	2,2',3,4,5' -PeCB	C86							
88	2,2',3,4,6 -PeCB	C	1.25	0.673	22:41		1.91	#	J K
89	2,2',3,4,6' -PeCB		ND	0.716					U
90	2,2',3,4',5 -PeCB	C	7.79	0.555	25:16		1.51		
91	2,2',3,4',6 -PeCB	C88							
92	2,2',3,5,5' -PeCB		1.41	0.660	24:31		1.48		
93	2,2',3,5,6 -PeCB	C	ND	0.653					U
94	2,2',3,5,6' -PeCB		ND	0.704					U
95	2,2',3,5',6 -PeCB		7.56	0.679	21:41		1.53		
96	2,2',3,6,6' -PeCB		ND	0.689					U
97	2,2',3,4',5' -PeCB	C86							
98	2,2',3,4',6' -PeCB	C	ND	0.662					U
99	2,2',4,4',5 -PeCB		2.96	0.513	25:58		1.37		

X5
4.2
12.7
3.73
53
4.49
2.32
29.05
7.85
9.55
8.15
14.35
7.15
35.45
6.25
38.95
7.05
37.8
14.8

PCB Congener Results by Method 1668A

Paradigm Analytical Labs

Client Project ID: Lab Method Blank

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Client Sample ID
LMB13016

No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT	Ratio #	Qualifier	
100	2,2',4,4',6 -PeCB	C93						
101	2,2',4,5,5' -PeCB	C90						
102	2,2',4,5,6' -PeCB	C98						
103	2,2',4,5',6 -PeCB		ND	0.649			U	
104	2,2',4,6,6' -PeCB		ND	0.339			U	
105	2,3,3',4,4' -PeCB		7.00	0.847	33:33	1.48		35
106	2,3,3',4,5 -PeCB		ND	0.779			U	
107	2,3,3',4',5 -PeCB	C	ND	0.793			U	
108	2,3,3',4,5' -PeCB	C86						
109	2,3,3',4,6 -PeCB		ND	0.698			U	
110	2,3,3',4',6 -PeCB	C	11.8	0.467	27:49	1.47		59
111	2,3,3',5,5' -PeCB		ND	0.445			U	
112	2,3,3',5,6 -PeCB		ND	0.456			U	
113	2,3,3',5',6 -PeCB	C90						
114	2,3,4,4',5 -PeCB		ND	0.841			U	
115	2,3,4,4',6 -PeCB	C110						
116	2,3,4,5,6 -PeCB	C85						
117	2,3,4',5,6 -PeCB	C85						
118	2,3',4,4',5 -PeCB		11.9	0.786	31:53	1.64		59.5
119	2,3',4,4',6 -PeCB	C86						
120	2,3',4,5,5' -PeCB		ND	0.437			U	
121	2,3',4,5',6 -PeCB		ND	0.479			U	
122	2,3,3',4',5' -PeCB		ND	0.826			U	
123	2,3',4,4',5' -PeCB		ND	0.810			U	
124	2,3',4',5,5' -PeCB	C107						
125	2,3',4',5',6 -PeCB	C86						
126	3,3',4,4',5 -PeCB		ND	0.841			U	
127	3,3',4,5,5' -PeCB		ND	0.756			U	
128	2,2',3,3',4,4' -HxCB	C	5.56	0.491	38:11	1.16		27.8
129	2,2',3,3',4,5 -HxCB	C	19.7	0.528	36:21	1.26		98.5
130	2,2',3,3',4,5' -HxCB		1.57	0.625	35:24	1.51 #	K	7.85
131	2,2',3,3',4,6 -HxCB		ND	0.597			U	
132	2,2',3,3',4,6' -HxCB		4.68	0.572	32:03	1.38		23.4
133	2,2',3,3',5,5' -HxCB		ND	0.571			U	
134	2,2',3,3',5,6 -HxCB		0.826	0.629	30:32	1.00 #	JK	4.13
135	2,2',3,3',5,6' -HxCB	C	2.06	0.759	29:04	1.31		10.3
136	2,2',3,3',6,6' -HxCB		1.15	0.606	25:55	1.39		5.75
137	2,2',3,4,4',5 -HxCB		1.59	0.533	35:44	1.12		7.95
138	2,2',3,4,4',5' -HxCB	C129						
139	2,2',3,4,4',6 -HxCB	C	ND	0.520			U	
140	2,2',3,4,4',6' -HxCB	C139						
141	2,2',3,4,5,5' -HxCB		2.09	0.521	34:49	1.08		10.45
142	2,2',3,4,5,6 -HxCB		ND	0.612			U	
143	2,2',3,4,5,6' -HxCB		ND	0.586			U	
144	2,2',3,4,5',6 -HxCB		ND	0.747			U	
145	2,2',3,4,6,6' -HxCB		ND	0.607			U	
146	2,2',3,4',5,5' -HxCB		1.31	0.475	33:40	1.03 #	K	6.55
147	2,2',3,4',5,6 -HxCB	C	5.45	0.512	30:18	1.46 #	K	27.25
148	2,2',3,4',5,6' -HxCB		ND	0.792			U	
149	2,2',3,4',5',6 -HxCB	C147						
150	2,2',3,4',6,6' -HxCB		ND	0.556			U	
151	2,2',3,5,5',6 -HxCB	C135						
152	2,2',3,5,6,6' -HxCB		ND	0.609			U	
153	2,2',4,4',5,5' -HxCB	C	8.75	0.441	34:31	1.23		43.75
154	2,2',4,4',5,6' -HxCB		ND	0.633			U	

PCB Congener Results by Method 1668A

Client Project ID: Lab Method Blank

Paradigm Analytical Labs

Client Sample ID
LMB13016

No.	Analyte Structure -LOC	CARP	Amount (pg/g)	EDL (pg/g)	RT #	Ratio #	Qualifier	
155	2,2',4,4',6,6' -HxCB		ND	0.406			U	
156	2,3,3',4,4',5 -HxCB	C	4.78	0.583	42:31	1.33		23.9
157	2,3,3',4,4',5' -HxCB	C156						
158	2,3,3',4,4',6 -HxCB		2.10	0.385	36:53	1.35		10.5
159	2,3,3',4,5,5' -HxCB		ND	0.548			U	
160	2,3,3',4,5,6 -HxCB		ND	0.405			U	
161	2,3,3',4,5',6 -HxCB		ND	0.428			U	
162	2,3,3',4',5,5' -HxCB		ND	0.536			U	
163	2,3,3',4',5,6 -HxCB	C129						
164	2,3,3',4',5',6 -HxCB		0.972	0.412	35:57	1.49 #	J K	4.86
165	2,3,3',5,5',6 -HxCB		ND	0.439			U	
166	2,3,4,4',5,6 -HxCB	C128						
167	2,3',4,4',5,5' -HxCB		1.22	0.514	40:49	1.19		6.1
168	2,3',4,4',5',6 -HxCB	C153						
169	3,3',4,4',5,5' -HxCB		ND	0.485			U	
170	2,2',3,3',4,4',5 -HpCB		3.98	0.701	46:36	1.01		19.9
171	2,2',3,3',4,4',6 -HpCB	C	ND	0.752			U	
172	2,2',3,3',4,5,5' -HpCB		ND	0.742			U	
173	2,2',3,3',4,5,6 -HpCB	C171						
174	2,2',3,3',4,5,6' -HpCB		ND	0.662			U	
175	2,2',3,3',4,5',6 -HpCB		ND	0.783			U	
176	2,2',3,3',4,6,6' -HpCB		ND	0.604			U	
177	2,2',3,3',4,5',6' -HpCB		ND	0.733			U	
178	2,2',3,3',5,5',6 -HpCB		ND	0.815			U	
179	2,2',3,3',5,6,6' -HpCB		ND	0.595			U	
180	2,2',3,4,4',5,5' -HpCB	C	4.68	0.583	44:40	1.15		23.4
181	2,2',3,4,4',5,6 -HpCB		ND	0.638			U	
182	2,2',3,4,4',5,6' -HpCB		ND	0.749			U	
183	2,2',3,4,4',5',6 -HpCB	C	ND	0.644			U	
184	2,2',3,4,4',6,6' -HpCB		ND	0.542			U	
185	2,2',3,4,5,5',6 -HpCB	C183						
186	2,2',3,4,5,6,6' -HpCB		ND	0.593			U	
187	2,2',3,4',5,5',6 -HpCB		1.17	0.697	38:19	0.99		5.85
188	2,2',3,4',5,6,6' -HpCB		ND	0.564			U	
189	2,3,3',4,4',5,5' -HpCB		ND	0.629			U	
190	2,3,3',4,4',5,6 -HpCB		ND	0.542			U	
191	2,3,3',4,4',5',6 -HpCB		ND	0.550			U	
192	2,3,3',4,5,5',6 -HpCB		ND	0.554			U	
193	2,3,3',4',5,5',6 -HpCB	C180						
194	2,2',3,3',4,4',5,5' -OcCB		ND	0.995			U	
195	2,2',3,3',4,4',5,6 -OcCB		ND	1.10			U	
196	2,2',3,3',4,4',5,6' -OcCB		ND	0.920			U	
197	2,2',3,3',4,4',6,6' -OcCB	C	ND	0.747			U	
198	2,2',3,3',4,5,5',6 -OcCB	C	ND	0.907			U	
199	2,2',3,3',4,5,5',6' -OcCB	C198						
200	2,2',3,3',4,5,6,6' -OcCB	C197						
201	2,2',3,3',4,5',6,6' -OcCB		ND	0.761			U	
202	2,2',3,3',5,5',6,6' -OcCB		ND	0.701			U	
203	2,2',3,4,4',5,5',6 -OcCB		ND	0.813			U	
204	2,2',3,4,4',5,6,6' -OcCB		ND	0.793			U	
205	2,3,3',4,4',5,5',6 -OcCB		ND	0.767			U	
206	2,2',3,3',4,4',5,5',6 -NoCB		ND	0.965			U	
207	2,2',3,3',4,4',5,6,6' -NoCB		ND	0.983			U	
208	2,2',3,3',4,5,5',6,6' -NoCB		ND	0.923			U	
209	2,2',3,3',4,4',5,5',6,6' -DeCB		ND	0.856			U	

Analyzed By: JWP

Date: 06-02-06

Reviewed By:

Date: 6/2/06

PCB Congener Results by Method 1668A | EPA FORM 2 | *Paradigm Analytical Labs*

Client Project ID: Lab Method Blank

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Client Sample ID
LMB13016

Recovery Information

No.	Labeled Standards Structure	-LOC	CARP	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards						(15-150%)			
1L	13C-2	-MoCB		2.00	0.749	37.4	6:43	3.34	
3L	13C-4	-MoCB		2.00	0.901	45.0	8:10	3.19	
						(25-150%)			
4L	13C-2,2'	-DiCB		2.00	0.643	32.1	8:20	1.63	
15L	13C-4,4'	-DiCB		2.00	0.997	49.9	12:49	1.62	
19L	13C-2,2',6	-TrCB		2.00	0.696	34.8	10:35	1.09	
37L	13C-3,4,4'	-TrCB		2.00	1.09	54.4	19:42	1.05	
54L	13C-2,2',6,6'	-TeCB		2.00	0.644	32.2	13:06	0.85	
77L	13C-3,3',4,4'	-TeCB		2.00	0.893	44.6	28:42	0.80	
81L	13C-3,4,4',5	-TeCB		2.00	0.873	43.6	27:56	0.80	
104L	13C-2,2',4,6,6'	-PeCB		2.00	0.914	45.7	18:21	1.55	
105L	13C-2,3,3',4,4'	-PeCB		2.00	0.918	45.9	33:31	1.65	
114L	13C-2,3,4,4',5	-PeCB		2.00	0.853	42.6	32:35	1.65	
118L	13C-2,3',4,4',5	-PeCB		2.00	0.890	44.5	31:51	1.62	
123L	13C-2,3',4,4',5'	-PeCB		2.00	0.953	47.7	31:24	1.61	
126L	13C-3,3',4,4',5	-PeCB		2.00	0.924	46.2	37:59	1.58	
155L	13C-2,2',4,4',6,6'	-HxCB		2.00	0.937	46.8	24:55	1.27	
156L	13C-2,3,3',4,4',5	-HxCB	C	4.00	1.94	48.6	42:31	1.31	
157L	13C-2,3,3',4,4',5'	-HxCB	C156L						
167L	13C-2,3',4,4',5,5'	-HxCB		2.00	1.06	53.0	40:46	1.29	
169L	13C-3,3',4,4',5,5'	-HxCB		2.00	1.07	53.6	47:29	1.30	
188L	13C-2,2',3,4',5,6,6'	-HpCB		2.00	0.804	40.2	32:34	1.09	
189L	13C-2,3,3',4,4',5,5'	-HpCB		2.00	1.04	51.9	51:26	1.05	
202L	13C-2,2',3,3',5,5',6,6'	-OcCB		2.00	0.744	37.2	40:24	0.93	
205L	13C-2,3,3',4,4',5,5',6	-OcCB		2.00	0.936	46.8	55:31	0.91	
206L	13C-2,2',3,3',4,4',5,5',6	-NoCB		2.00	0.853	42.7	58:18	0.80	
208L	13C-2,2',3,3',4,5,5',6,6'	-NoCB		2.00	0.826	41.3	50:41	0.82	
209L	13C-2,2',3,3',4,4',5,5',6,6'	-DeCB		2.00	0.764	38.2	60:50	1.21	
Cleanup Standards						(30-135%)			
28L	13C-2,4,4'	-TrCB		2.00	0.980	49.0	15:32	1.07	
111L	13C-2,3,3',5,5'	-PeCB		2.00	0.934	46.7	28:43	1.62	
178L	13C-2,2',3,3',5,5',6	-HpCB		2.00	0.911	45.6	36:58	1.08	
Injection Standards									
9L	13C-2,5	-DiCB		2.00			9:42	1.64	
52L	13C-2,2',5,5'	-TeCB		2.00			17:20	0.81	
101L	13C-2,2',4,5,5'	-PeCB		2.00			25:14	1.58	
138L	13C-2,2',3,4,4',5'	-HxCB		2.00			36:18	1.30	
194L	13C-2,2',3,3',4,4',5,5'	-OcCB		2.00			54:47	0.92	

Analyzed By: JWP

Date: 06-02-06

Reviewed By:

Date: 6/2/06

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(1)

CLIENT: URS - 907-565-9000

CONTACT: Lee Ann Nemec PHONE NO.: (907) 565-9000

PROJECT: FSP Fuel Area SITE/PWSID#:

REPORTS TO: Sam FAX NO.: (907) 565-9064

INVOICE TO: QUOTE #

P.O. NUMBER 1165C28.1000

SGS Reference: G296-275

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(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No. CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives Used	Analysis Required (3): PCB Congeners 1668A	REMARKS
	7155/2B ✓	4/20/06	1845	S	1			X	
	4155 9	4/21/06	1500	S	1			X	

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
	4/24/06	1400	
Relinquished By: (2)	Date	Time	Received By:
	4/24/06	9:10	Danielle M Kero ✓
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier: FedEx

Shipping Ticket No:

Special Deliverable Requirements:

Samples Received Cold? (Circle) YES NO

Temperature °C: 12.8 No ice. T

Chain of Custody Seal: (Circle)

INTACT BROKEN (ABSENT)

Requested Turnaround Time and Special Instructions:

7

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination	n	Failed Signal to noise ratio		

APPENDIX G.2.3

ADDITIONAL INVESTIGATIONS GROUNDWATER SAMPLING 2007

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DATA VALIDATION REPORT - Level III Review

SDG No.:_____36440-39_____ **Fraction:_VOCs, SVOCs, Pesticides, PCBs, Explosives, Total & Dissolved Metals__**

Lab:_____TriMatrix_____ **Project Name _____Radford SWMU 40_____**

Reviewer:_____RA_____ **Date:_____September 24, 2007_____**

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: For the VOCs analyses, the method blank displayed a positive detection for acetone at 1.53 ug/L. Positive associated field sample results less than ten times the method blank concentration were flagged "B,z". The trip blanks also displayed positive detections for acetone which was previously flagged for method blank contamination; and a positive detection for toluene at 0.14 ug/L. Positive associated field sample results less than five times the trip blank concentration for toluene were flagged "B,y".

For the SVOCs analyses, sample 40MW5 was re-extracted one day outside the holding time since the matrix spike/matrix spike duplicate (MS/MSD) analyzed for this sample was not fortified with 1,2,4,5-tetrachlorobenzene. Only 1,2,4,5-tetrachlorobenzene was reported for the re-extracted sample. This result was flagged "UJ,h". The original sample result for this compound should be used for data interpretation purposes.

The method blank displayed a positive detection for butyl benzyl phthalate at 0.05 ug/L. Positive associated field sample results less than ten times the method blank concentration were flagged "B,z". Equipment blank, EQBK-1 displayed positive detections for acetophenone at 0.048 ug/L and diethyl phthalate at 0.048 ug/L. The associated field sample results for acetophenone were non-detects and no data qualifying action was necessary. Positive associated field sample results less than ten times the equipment blank concentration for diethyl phthalate were flagged "B,x".

The matrix spike pair analyzed for sample 40MW5 displayed percent recoveries (%Rs) less than the lower control limit of 64% for caprolactam at 11% and 10%, respectively. The associated parent sample result was non-detect and was flagged "UJ,m".

The laboratory control sample (LCS) displayed a %R less than the lower control limit of 64% for caprolactam at 26%. Since this is not a project specific compound of concern, using professional judgment, all associated field sample results that were non-detects were flagged "UJ,l". The LCS also displayed a %R greater than the upper control limit of 105% for 2-chlorophenol at 108%. The associated field sample results were non-detects and no data qualifying action was necessary.

For the pesticides analyses, the matrix spike pair analyzed for sample 40MW5 displayed %Rs greater than the upper control limit of 140% for aldrin on the confirmation column at 167% and 186%, respectively. The associated parent sample result was a non-detect and no data qualifying action was required.

Gamma-BHC displayed percent differences greater than the control limit of 40% between the two analytical columns for sample 17MW3 at 91.7% and sample 40MW6 at 102.5%. These results were flagged "J,g" in these samples.

For the metals analyses, for method 6010, the method blanks displayed positive detections for total iron, magnesium, and sodium; and for dissolved calcium, magnesium, and sodium. Positive associated field sample results less than five times the method blank concentrations were flagged "B,p". Equipment blank, EQBK-1 displayed positive detections for total calcium and potassium. The initial and continuing calibration blanks displayed low level detections for magnesium, sodium, and iron. The associated field sample results were greater than five times the blank concentrations and no further data qualifying action was taken.

For method 6020, the method blanks displayed positive detections for dissolved chromium and zinc. Positive associated field sample results less than five times the method blank concentrations were flagged "B,p". Equipment blank, EQBK-1 displayed positive detections for total chromium, lead, manganese, and zinc. Positive associated field sample results less than five times the equipment blank concentration were flagged "B,x". The initial and continuing calibration blanks displayed positive detections for antimony, chromium, and selenium. Positive associated field sample results less than five times the calibration blank concentrations were flagged "B,o".

The matrix spike analyzed for sample 40MW5 displayed a %R greater than the upper control limit of 125% for dissolved calcium at 151%. No data qualifying action was required since the original sample result was greater than 4 times the spike amount.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed. It should be noted that detection limits were raised in several samples due to dilutions.

Signed: Rayen

TriMatrix
Laboratories, Inc.

SDG CASE NARRATIVE

URS Corporation
Radford Army Ammunition Plant
Groundwater Investigation
SWMU 40

SDG – 36440-39
SEPTEMBER 19, 2007

This case narrative is applicable to aqueous samples collected from SWMU 40 at Radford Army Ammunition Plant (the Site), Radford, Virginia by URS Corporation (the Client) and received by TriMatrix Laboratories, Inc. (TriMatrix) on August 15 and 16, 2007. The samples were assigned to TriMatrix project sample delivery group (SDG) 36440-39 for analytical services (the Project) to be performed according to:

a) URS Project #21354880.10001, BOA # 129851.UB, and URS Work Order 129877.US

b) the Scope of Work (SOW) for the above,

c) Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006 (by reference)

d) any verbal and written correspondence between the Client and TriMatrix as the Project progressed.

No part of this Project was subcontracted.

Field Sample and Assigned Laboratory Sample ID Summary

For the samples received, a field sample to laboratory sample ID cross-reference table follows below and on the next page.

Field Sample Name	Sample Matrix	Laboratory Sample ID	Date Sampled	Date Received
17MW3	Water	0708362-01	08/13/07	08/15/07
Trip Blank 1	Water	0708362-02	08/13/07	08/15/07
40MW3	Water	0708362-03	08/14/07	08/15/07
Trip Blank 2	Water	0708362-04	08/14/07	08/15/07
EQBK-1	Water	0708362-05	08/14/07	08/15/07
Trip Blank 3	Water	0708362-06	08/14/07	08/15/07
40MW6	Water	0708363-01	08/14/07	08/16/07
Trip Blank 4	Water	0708363-02	08/14/07	08/16/07
40MW5	Water	0708363-03	08/15/07	08/16/07
Trip Blank 5	Water	0708363-04	08/15/07	08/16/07
DUP-1	Water	0708363-05	08/15/07	08/16/07
Trip Blank 6	Water	0708363-06	08/15/07	08/16/07

Dup 1

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Individual sample results relate only to the sample tested.

SAMPLE ID SUMMARY

USEPA-8260B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-39
Client: URS Corporation
Project: RFAAP SWMU 40

Client Sample Id:	Lab Sample Id:
17MW3	0708362-01
Trip Blank 1	0708362-02
40MW3	0708362-03
Trip Blank 2	0708362-04
EQBK-1	0708362-05
Trip Blank 3	0708362-06
40MW6	0708363-01
Trip Blank 4	0708363-02
40MW5	0708363-03
Trip Blank 5	0708363-04
DUP-1	0708363-05
Trip Blank 6	0708363-06

RA 071107

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

17MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-01 File ID: 36201.D

Sampled: 08/13/07 18:05 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 11:13

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	20	20	1.2	U
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	1.0	1.0	0.061	U
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

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ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

17MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-01 File ID: 36201.D

Sampled: 08/13/07 18:05 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 11:13

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	1.0	1.0	0.072	U
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	40.8	102	85 - 115	
1,2-Dichloroethane-d4	40.0	42.6	107	70 - 120	
Toluene-d8	40.0	41.0	103	85 - 120	
4-Bromofluorobenzene	40.0	38.8	97	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	730022	5.16	786914	5.16	
Chlorobenzene-d5	685768	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	360382	10.39	408912	10.39	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank

RA 10/11/07

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-02 File ID: 36202.D

Sampled: 08/13/07 18:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 13:40

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	3.1	20	1.2	J B,Z
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	1.0	1.0	0.061	U
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

ORGANIC ANALYSIS DATA SHEET

USEPA-8260B

Trip Blank

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-02 File ID: 36202.D

Sampled: 08/13/07 18:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 13:40

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	1.0	1.0	0.072	U
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	42.2	106	85 - 115	
1,2-Dichloroethane-d4	40.0	43.5	109	70 - 120	
Toluene-d8	40.0	41.2	103	85 - 120	
4-Bromofluorobenzene	40.0	38.2	95	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	683475	5.16	786914	5.16	
Chlorobenzene-d5	654842	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	334862	10.39	408912	10.39	

* Values outside of QC limits

00128

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

40MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-03 File ID: 36203.D

Sampled: 08/14/07 13:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 11:44

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	20	20	1.2	U
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	19	1.0	0.061	
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

40MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-03 File ID: 36203.D

Sampled: 08/14/07 13:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 11:44

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	1.0	1.0	0.072	U
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	42.1	105	85 - 115	
1,2-Dichloroethane-d4	40.0	42.7	107	70 - 120	
Toluene-d8	40.0	40.8	102	85 - 120	
4-Bromofluorobenzene	40.0	38.3	96	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	693452	5.16	786914	5.16	
Chlorobenzene-d5	650534	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	347331	10.39	408912	10.39	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank 2

RA 10/1/07

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-04 File ID: 36204.D

Sampled: 08/14/07 13:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 14:09

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	20	20	1.2	U
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	1.0	1.0	0.061	U
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-04 File ID: 36204.D

Sampled: 08/14/07 13:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 14:09

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	0.14	1.0	0.072	J
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	41.9	105	85 - 115	
1,2-Dichloroethane-d4	40.0	44.0	110	70 - 120	
Toluene-d8	40.0	41.2	103	85 - 120	
4-Bromofluorobenzene	40.0	38.7	97	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	658054	5.16	786914	5.16	
Chlorobenzene-d5	629893	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	330094	10.39	408912	10.39	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-05 File ID: 36205.D

Sampled: 08/14/07 14:05 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 14:40

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	20	20	1.2	U
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	1.0	1.0	0.061	U
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

00145

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-05 File ID: 36205.D

Sampled: 08/14/07 14:05 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 14:40

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	1.0	1.0	0.072	U
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	41.9	105	85 - 115	
1,2-Dichloroethane-d4	40.0	43.0	108	70 - 120	
Toluene-d8	40.0	41.1	103	85 - 120	
4-Bromofluorobenzene	40.0	38.6	96	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	676790	5.16	786914	5.16	
Chlorobenzene-d5	640861	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	337281	10.39	408912	10.39	

* Values outside of QC limits

00145

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank 3

RA 10/1/07

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-06 File ID: 36206.D

Sampled: 08/14/07 14:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 15:10

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	20	20	1.2	U
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	1.0	1.0	0.061	U
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-06 File ID: 36206.D

Sampled: 08/14/07 14:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 15:10

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	0.14	1.0	0.072	J
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	42.0	105	85 - 115	
1,2-Dichloroethane-d4	40.0	43.2	108	70 - 120	
Toluene-d8	40.0	41.3	103	85 - 120	
4-Bromofluorobenzene	40.0	38.8	97	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	682709	5.16	786914	5.16	
Chlorobenzene-d5	652123	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	343309	10.39	408912	10.39	

* Values outside of QC limits

00151

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

40MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-01 File ID: 36301.D

Sampled: 08/14/07 19:40 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 12:13

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	1.6	20	1.2	J B, E
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	24	1.0	0.061	
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

00156

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

40MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-01 File ID: 36301.D

Sampled: 08/14/07 19:40 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 12:13

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	1.0	1.0	0.072	U
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	41.9	105	85 - 115	
1,2-Dichloroethane-d4	40.0	42.9	107	70 - 120	
Toluene-d8	40.0	40.9	102	85 - 120	
4-Bromofluorobenzene	40.0	38.9	97	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	699854	5.16	786914	5.16	
Chlorobenzene-d5	659536	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	348671	10.39	408912	10.39	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank 4

RA 20/1107

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708363-02 File ID: 36302.D

Sampled: 08/14/07 20:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 15:41

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	3.1	20	1.2	J B,Z
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	1.0	1.0	0.061	U
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708363-02 File ID: 36302.D

Sampled: 08/14/07 20:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 15:41

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	1.0	1.0	0.072	U
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	41.9	105	85 - 115	
1,2-Dichloroethane-d4	40.0	43.2	108	70 - 120	
Toluene-d8	40.0	41.2	103	85 - 120	
4-Bromofluorobenzene	40.0	38.3	96	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	665138	5.16	786914	5.16	
Chlorobenzene-d5	635547	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	330891	10.39	408912	10.39	

* Values outside of QC limits

00163

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

40MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-03 File ID: 36303.D

Sampled: 08/15/07 12:15 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 12:42

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	20	20	1.2	U
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	23	1.0	0.061	
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

00168

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

40MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-03 File ID: 36303.D

Sampled: 08/15/07 12:15 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 12:42

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	0.090	1.0	0.072	J B, Y
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	42.7	107	85 - 115	
1,2-Dichloroethane-d4	40.0	42.9	107	70 - 120	
Toluene-d8	40.0	41.0	103	85 - 120	
4-Bromofluorobenzene	40.0	39.2	98	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	704762	5.16	786914	5.16	
Chlorobenzene-d5	665137	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	351574	10.39	408912	10.39	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank 5

RA 10/11/07

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708363-04 File ID: 36304.D

Sampled: 08/15/07 12:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 16:10

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	3.0	20	1.2	J B,Z
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	1.0	1.0	0.061	U
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708363-04 File ID: 36304.D

Sampled: 08/15/07 12:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 16:10

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	1.0	1.0	0.072	U
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	42.6	107	85 - 115	
1,2-Dichloroethane-d4	40.0	44.0	110	70 - 120	
Toluene-d8	40.0	41.7	104	85 - 120	
4-Bromofluorobenzene	40.0	38.7	97	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	662370	5.16	786914	5.16	
Chlorobenzene-d5	639288	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	333417	10.39	408912	10.39	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-05 File ID: 36305.D

Sampled: 08/15/07 00:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 13:11

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	20	20	1.2	U
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	23	1.0	0.061	
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

00131

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-05 File ID: 36305.D

Sampled: 08/15/07 00:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 13:11

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	0.090	1.0	0.072	J B2 Y
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	42.0	105	85 - 115	
1,2-Dichloroethane-d4	40.0	43.4	108	70 - 120	
Toluene-d8	40.0	41.2	103	85 - 120	
4-Bromofluorobenzene	40.0	39.6	99	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	700426	5.16	786914	5.16	
Chlorobenzene-d5	658519	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	347346	10.39	408912	10.39	

* Values outside of QC limits

00182

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank ✓

RA 10/11/07

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708363-06 File ID: 36306.D

Sampled: 08/15/07 12:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 16:39

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
67-64-1	Acetone	1	3.2	20	1.2	J B, Z
71-43-2	Benzene	1	1.0	1.0	0.12	U
74-97-5	Bromochloromethane	1	1.0	1.0	0.20	U
75-27-4	Bromodichloromethane	1	1.0	1.0	0.19	U
75-25-2	Bromoform	1	1.0	1.0	0.23	U
74-83-9	Bromomethane	1	1.0	1.0	0.19	U
75-15-0	Carbon Disulfide	1	5.0	5.0	0.28	U
56-23-5	Carbon Tetrachloride	1	1.0	1.0	0.15	U
108-90-7	Chlorobenzene	1	1.0	1.0	0.12	U
75-00-3	Chloroethane	1	1.0	1.0	0.20	U
67-66-3	Chloroform	1	1.0	1.0	0.061	U
74-87-3	Chloromethane	1	1.0	1.0	0.060	U
110-82-7	Cyclohexane	1	5.0	5.0	0.14	U
96-12-8	1,2-Dibromo-3-chloropropane	1	5.0	5.0	0.29	U
124-48-1	Dibromochloromethane	1	1.0	1.0	0.14	U
106-93-4	1,2-Dibromoethane	1	1.0	1.0	0.22	U
95-50-1	1,2-Dichlorobenzene	1	1.0	1.0	0.065	U
541-73-1	1,3-Dichlorobenzene	1	1.0	1.0	0.12	U
106-46-7	1,4-Dichlorobenzene	1	1.0	1.0	0.13	U
75-71-8	Dichlorodifluoromethane	1	1.0	1.0	0.17	U
75-34-3	1,1-Dichloroethane	1	1.0	1.0	0.076	U
107-06-2	1,2-Dichloroethane	1	1.0	1.0	0.15	U
75-35-4	1,1-Dichloroethene	1	1.0	1.0	0.14	U
156-59-2	cis-1,2-Dichloroethene	1	1.0	1.0	0.17	U
156-60-5	trans-1,2-Dichloroethene	1	1.0	1.0	0.16	U
78-87-5	1,2-Dichloropropane	1	1.0	1.0	0.10	U
10061-01-5	cis-1,3-Dichloropropene	1	1.0	1.0	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	1.0	1.0	0.16	U
100-41-4	Ethylbenzene	1	1.0	1.0	0.13	U
591-78-6	2-Hexanone	1	10	10	0.42	U
98-82-8	Isopropylbenzene	1	1.0	1.0	0.12	U
79-20-9	Methyl Acetate	1	5.0	5.0	0.16	U
1634-04-4	Methyl tert-Butyl Ether	1	1.0	1.0	0.096	U
108-87-2	Methylcyclohexane	1	5.0	5.0	0.15	U

00187

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

Trip Blank

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708363-06 File ID: 36306.D

Sampled: 08/15/07 12:00 Prepared: 08/20/07 09:00 Analyzed: 08/20/07 16:39

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
75-09-2	Methylene Chloride	1	5.0	5.0	0.051	U
78-93-3	2-Butanone (MEK)	1	10	10	0.33	U
108-10-1	4-Methyl-2-pentanone (MIBK)	1	10	10	0.38	U
100-42-5	Styrene	1	1.0	1.0	0.11	U
79-34-5	1,1,2,2-Tetrachloroethane	1	1.0	1.0	0.10	U
127-18-4	Tetrachloroethene	1	1.0	1.0	0.15	U
108-88-3	Toluene	1	1.0	1.0	0.072	U
87-61-6	1,2,3-Trichlorobenzene	1	2.0	2.0	0.13	U
120-82-1	1,2,4-Trichlorobenzene	1	2.0	2.0	0.16	U
71-55-6	1,1,1-Trichloroethane	1	1.0	1.0	0.11	U
79-00-5	1,1,2-Trichloroethane	1	1.0	1.0	0.21	U
79-01-6	Trichloroethene	1	1.0	1.0	0.17	U
75-69-4	Trichlorofluoromethane	1	1.0	1.0	0.18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	1.0	1.0	0.14	U
75-01-4	Vinyl Chloride	1	1.0	1.0	0.17	U
1330-20-7	Xylene (Total)	1	3.0	3.0	0.36	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane	40.0	42.7	107	85 - 115	
1,2-Dichloroethane-d4	40.0	43.4	109	70 - 120	
Toluene-d8	40.0	41.4	103	85 - 120	
4-Bromofluorobenzene	40.0	38.7	97	75 - 120	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene	669528	5.16	786914	5.16	
Chlorobenzene-d5	641248	8.09	723117	8.09	
1,4-Dichlorobenzene-d4	329495	10.39	408912	10.39	

* Values outside of QC limits

SAMPLE ID SUMMARY

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-39

Client: URS Corporation

Project: RFAAP SWMU 40

Client Sample Id:	Lab Sample Id:
17MW3	0708362-01
40MW3	0708362-03
EQBK-1	0708362-05
40MW6	0708363-01
40MW5	0708363-03
40MW5	0708363-03RE1
DUP-1	0708363-05

00272

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

17MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-01 File ID: 0708362-01.D

Sampled: 08/13/07 18:05 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 11:41

Solids: Preparation: 3510C Liquid-Liquid Extr Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
83-32-9	Acenaphthene	1	5.0	5.0	0.013	U
208-96-8	Acenaphthylene	1	5.0	5.0	0.012	U
98-86-2	Acetophenone	1	5.0	5.0	0.043	U
120-12-7	Anthracene	1	5.0	5.0	0.014	U
1912-24-9	Atrazine	1	5.0	5.0	0.026	U
100-52-7	Benzaldehyde	1	5.0	5.0	0.051	U
56-55-3	Benzo(a)anthracene	1	5.0	5.0	0.037	U
50-32-8	Benzo(a)pyrene	1	5.0	5.0	0.023	U
205-99-2	Benzo(b)fluoranthene	1	5.0	5.0	0.040	U
207-08-9	Benzo(k)fluoranthene	1	5.0	5.0	0.036	U
191-24-2	Benzo(g,h,i)perylene	1	5.0	5.0	0.022	U
92-52-4	1,1'-Biphenyl	1	5.0	5.0	0.015	U
101-55-3	4-Bromophenyl Phenyl Ether	1	5.0	5.0	0.026	U
85-68-7	Butyl Benzyl Phthalate	1	0.057	5.0	0.029	J B, Z
105-60-2	Caprolactam	1	5.0	5.0	0.14	U UJ, l
86-74-8	Carbazole	1	5.0	5.0	0.018	U
59-50-7	4-Chloro-3-methylphenol	1	5.0	5.0	0.021	U
106-47-8	4-Chloroaniline	1	5.0	5.0	0.021	U
111-91-1	Bis(2-chloroethoxy)methane	1	5.0	5.0	0.016	U
111-44-4	Bis(2-chloroethyl) Ether	1	5.0	5.0	0.016	U
108-60-1	Bis(2-chloroisopropyl) Ether	1	5.0	5.0	0.047	U
91-58-7	2-Chloronaphthalene	1	5.0	5.0	0.012	U
95-57-8	2-Chlorophenol	1	5.0	5.0	0.016	U
7005-72-3	4-Chlorophenyl Phenyl Ether	1	5.0	5.0	0.016	U
218-01-9	Chrysene	1	5.0	5.0	0.020	U
53-70-3	Dibenz(a,h)anthracene	1	5.0	5.0	0.026	U
132-64-9	Dibenzofuran	1	5.0	5.0	0.016	U
84-74-2	Di-n-butyl Phthalate	1	5.0	5.0	0.38	U
91-94-1	3,3'-Dichlorobenzidine	1	5.0	5.0	0.21	U
120-83-2	2,4-Dichlorophenol	1	5.0	5.0	0.015	U
84-66-2	Diethyl Phthalate	1	0.057	5.0	0.034	J B, X
105-67-9	2,4-Dimethylphenol	1	5.0	5.0	0.33	U
131-11-3	Dimethyl Phthalate	1	0.019	5.0	0.016	J
534-52-1	4,6-Dinitro-2-methylphenol	1	5.0	5.0	0.12	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

17MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-01 File ID: 0708362-01.D

Sampled: 08/13/07 18:05 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 11:41

Solids: Preparation: 3510C Liquid-Liquid Extı Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
51-28-5	2,4-Dinitrophenol	1	10	10	1.5	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.21	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.050	U
117-84-0	Di-n-octyl Phthalate	1	5.0	5.0	0.34	U
117-81-7	Bis(2-ethylhexyl) Phthalate	1	5.0	5.0	0.41	U
206-44-0	Fluoranthene	1	5.0	5.0	0.016	U
86-73-7	Fluorene	1	5.0	5.0	0.011	U
118-74-1	Hexachlorobenzene	1	5.0	5.0	0.019	U
87-68-3	Hexachlorobutadiene	1	5.0	5.0	0.018	U
77-47-4	Hexachlorocyclopentadiene	1	5.0	5.0	0.13	U
67-72-1	Hexachloroethane	1	5.0	5.0	0.038	U
193-39-5	Indeno(1,2,3-cd)pyrene	1	5.0	5.0	0.014	U
78-59-1	Isophorone	1	5.0	5.0	0.031	U
91-57-6	2-Methylnaphthalene	1	5.0	5.0	0.015	U
95-48-7	2-Methylphenol	1	5.0	5.0	0.14	U
106-44-5	4-Methylphenol	1	5.0	5.0	0.16	U
91-20-3	Naphthalene	1	5.0	5.0	0.023	U
88-74-4	2-Nitroaniline	1	5.0	5.0	0.12	U
99-09-2	3-Nitroaniline	1	5.0	5.0	0.13	U
100-01-6	4-Nitroaniline	1	5.0	5.0	0.14	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.026	U
100-02-7	4-Nitrophenol	1	10	10	1.3	U
88-75-5	2-Nitrophenol	1	5.0	5.0	0.026	U
86-30-6	N-Nitroso-diphenylamine	1	5.0	5.0	0.019	U
621-64-7	N-Nitroso-di-n-propylamine	1	5.0	5.0	0.030	U
87-86-5	Pentachlorophenol	1	10	10	0.19	U
85-01-8	Phenanthrene	1	5.0	5.0	0.015	U
108-95-2	Phenol	1	5.0	5.0	0.028	U
129-00-0	Pyrene	1	5.0	5.0	0.047	U
95-94-3	1,2,4,5-Tetrachlorobenzene	1	5.0	5.0	0.024	U
58-90-2	2,3,4,6-Tetrachlorophenol	1	5.0	5.0	0.16	U
88-06-2	2,4,6-Trichlorophenol	1	5.0	5.0	0.027	U
95-95-4	2,4,5-Trichlorophenol	1	5.0	5.0	0.11	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q

00309

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

17MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-01 File ID: 0708362-01.D

Sampled: 08/13/07 18:05 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 11:41

Solids: Preparation: 3510C Liquid-Liquid Extı Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
2-Fluorophenol	18.9	9.88	52	20 - 110	
Phenol-d6	18.9	6.30	33	10 - 115	
Nitrobenzene-d5	9.43	8.64	92	40 - 110	
2-Fluorobiphenyl	9.43	7.39	78	50 - 110	
2,4,6-Tribromophenol	19.0	15.7	83	40 - 125	
o-Terphenyl	9.43	9.08	96	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	44693	11.799	42581	11.799	
Naphthalene-d8	166892	14.702	172364	14.702	
Acenaphthene-d10	83122	18.758	90451	18.758	
Phenanthrene-d10	122747	21.305	130988	21.311	
Chrysene-d12	100458	25.187	113027	25.193	
Perylene-d12	84748	28.784	95944	28.789	

* Values outside of QC limits

00310

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

40MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-03 File ID: 0708362-03.D

Sampled: 08/14/07 13:00 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 12:24

Solids: Preparation: 3510C Liquid-Liquid Extr Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
83-32-9	Acenaphthene	1	5.0	5.0	0.013	U
208-96-8	Acenaphthylene	1	5.0	5.0	0.012	U
98-86-2	Acetophenone	1	5.0	5.0	0.043	U
120-12-7	Anthracene	1	5.0	5.0	0.014	U
1912-24-9	Atrazine	1	5.0	5.0	0.026	U
100-52-7	Benzaldehyde	1	5.0	5.0	0.051	U
56-55-3	Benzo(a)anthracene	1	5.0	5.0	0.037	U
50-32-8	Benzo(a)pyrene	1	5.0	5.0	0.023	U
205-99-2	Benzo(b)fluoranthene	1	5.0	5.0	0.040	U
207-08-9	Benzo(k)fluoranthene	1	5.0	5.0	0.036	U
191-24-2	Benzo(g,h,i)perylene	1	5.0	5.0	0.022	U
92-52-4	1,1'-Biphenyl	1	5.0	5.0	0.015	U
101-55-3	4-Bromophenyl Phenyl Ether	1	5.0	5.0	0.026	U
85-68-7	Butyl Benzyl Phthalate	1	0.057	5.0	0.029	J B, Z
105-60-2	Caprolactam	1	5.0	5.0	0.14	U UJ, L
86-74-8	Carbazole	1	5.0	5.0	0.018	U
59-50-7	4-Chloro-3-methylphenol	1	5.0	5.0	0.021	U
106-47-8	4-Chloroaniline	1	5.0	5.0	0.021	U
111-91-1	Bis(2-chloroethoxy)methane	1	5.0	5.0	0.016	U
111-44-4	Bis(2-chloroethyl) Ether	1	5.0	5.0	0.016	U
108-60-1	Bis(2-chloroisopropyl) Ether	1	5.0	5.0	0.047	U
91-58-7	2-Chloronaphthalene	1	5.0	5.0	0.012	U
95-57-8	2-Chlorophenol	1	5.0	5.0	0.016	U
7005-72-3	4-Chlorophenyl Phenyl Ether	1	5.0	5.0	0.016	U
218-01-9	Chrysene	1	5.0	5.0	0.020	U
53-70-3	Dibenz(a,h)anthracene	1	5.0	5.0	0.026	U
132-64-9	Dibenzofuran	1	5.0	5.0	0.016	U
84-74-2	Di-n-butyl Phthalate	1	5.0	5.0	0.38	U
91-94-1	3,3'-Dichlorobenzidine	1	5.0	5.0	0.21	U
120-83-2	2,4-Dichlorophenol	1	5.0	5.0	0.015	U
84-66-2	Diethyl Phthalate	1	0.038	5.0	0.034	J B, X
105-67-9	2,4-Dimethylphenol	1	5.0	5.0	0.33	U
131-11-3	Dimethyl Phthalate	1	5.0	5.0	0.016	U
534-52-1	4,6-Dinitro-2-methylphenol	1	5.0	5.0	0.12	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

40MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-03 File ID: 0708362-03.D

Sampled: 08/14/07 13:00 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 12:24

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
51-28-5	2,4-Dinitrophenol	1	10	10	1.5	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.21	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.050	U
117-84-0	Di-n-octyl Phthalate	1	5.0	5.0	0.34	U
117-81-7	Bis(2-ethylhexyl) Phthalate	1	5.0	5.0	0.41	U
206-44-0	Fluoranthene	1	5.0	5.0	0.016	U
86-73-7	Fluorene	1	5.0	5.0	0.011	U
118-74-1	Hexachlorobenzene	1	5.0	5.0	0.019	U
87-68-3	Hexachlorobutadiene	1	5.0	5.0	0.018	U
77-47-4	Hexachlorocyclopentadiene	1	5.0	5.0	0.13	U
67-72-1	Hexachloroethane	1	5.0	5.0	0.038	U
193-39-5	Indeno(1,2,3-cd)pyrene	1	5.0	5.0	0.014	U
78-59-1	Isophorone	1	5.0	5.0	0.031	U
91-57-6	2-Methylnaphthalene	1	5.0	5.0	0.015	U
95-48-7	2-Methylphenol	1	5.0	5.0	0.14	U
106-44-5	4-Methylphenol	1	5.0	5.0	0.16	U
91-20-3	Naphthalene	1	5.0	5.0	0.023	U
88-74-4	2-Nitroaniline	1	5.0	5.0	0.12	U
99-09-2	3-Nitroaniline	1	5.0	5.0	0.13	U
100-01-6	4-Nitroaniline	1	5.0	5.0	0.14	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.026	U
100-02-7	4-Nitrophenol	1	10	10	1.3	U
88-75-5	2-Nitrophenol	1	5.0	5.0	0.026	U
86-30-6	N-Nitroso-diphenylamine	1	5.0	5.0	0.019	U
621-64-7	N-Nitroso-di-n-propylamine	1	5.0	5.0	0.030	U
87-86-5	Pentachlorophenol	1	10	10	0.19	U
85-01-8	Phenanthrene	1	5.0	5.0	0.015	U
108-95-2	Phenol	1	5.0	5.0	0.028	U
129-00-0	Pyrene	1	5.0	5.0	0.047	U
95-94-3	1,2,4,5-Tetrachlorobenzene	1	5.0	5.0	0.024	U
58-90-2	2,3,4,6-Tetrachlorophenol	1	5.0	5.0	0.16	U
88-06-2	2,4,6-Trichlorophenol	1	5.0	5.0	0.027	U
95-95-4	2,4,5-Trichlorophenol	1	5.0	5.0	0.11	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

40MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-03 File ID: 0708362-03.D

Sampled: 08/14/07 13:00 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 12:24

Solids: Preparation: 3510C Liquid-Liquid Extr Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
2-Fluorophenol	18.9	9.44	50	20 - 110	
Phenol-d6	18.9	5.92	31	10 - 115	
Nitrobenzene-d5	9.43	7.71	82	40 - 110	
2-Fluorobiphenyl	9.43	6.35	67	50 - 110	
2,4,6-Tribromophenol	19.0	13.1	69	40 - 125	
o-Terphenyl	9.43	7.66	81	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	47680	11.799	42581	11.799	
Naphthalene-d8	187272	14.702	172364	14.702	
Acenaphthene-d10	95869	18.758	90451	18.758	
Phenanthrene-d10	144146	21.305	130988	21.311	
Chrysene-d12	112781	25.187	113027	25.193	
Perylene-d12	100646	28.784	95944	28.789	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-05 File ID: 0708362-05.D

Sampled: 08/14/07 14:05 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 13:06

Solids: Preparation: 3510C Liquid-Liquid Extn Initial/Final: 1050 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
83-32-9	Acenaphthene	1	5.0	5.0	0.013	U
208-96-8	Acenaphthylene	1	5.0	5.0	0.012	U
98-86-2	Acetophenone	1	0.048	5.0	0.043	J
120-12-7	Anthracene	1	5.0	5.0	0.014	U
1912-24-9	Atrazine	1	5.0	5.0	0.026	U
100-52-7	Benzaldehyde	1	5.0	5.0	0.051	U
56-55-3	Benzo(a)anthracene	1	5.0	5.0	0.037	U
50-32-8	Benzo(a)pyrene	1	5.0	5.0	0.023	U
205-99-2	Benzo(b)fluoranthene	1	5.0	5.0	0.040	U
207-08-9	Benzo(k)fluoranthene	1	5.0	5.0	0.036	U
191-24-2	Benzo(g,h,i)perylene	1	5.0	5.0	0.022	U
92-52-4	1,1'-Biphenyl	1	5.0	5.0	0.015	U
101-55-3	4-Bromophenyl Phenyl Ether	1	5.0	5.0	0.026	U
85-68-7	Butyl Benzyl Phthalate	1	0.14	5.0	0.029	J B, E
105-60-2	Caprolactam	1	5.0	5.0	0.14	U UJ, l
86-74-8	Carbazole	1	5.0	5.0	0.018	U
59-50-7	4-Chloro-3-methylphenol	1	5.0	5.0	0.021	U
106-47-8	4-Chloroaniline	1	5.0	5.0	0.021	U
111-91-1	Bis(2-chloroethoxy)methane	1	5.0	5.0	0.016	U
111-44-4	Bis(2-chloroethyl) Ether	1	5.0	5.0	0.016	U
108-60-1	Bis(2-chloroisopropyl) Ether	1	5.0	5.0	0.047	U
91-58-7	2-Chloronaphthalene	1	5.0	5.0	0.012	U
95-57-8	2-Chlorophenol	1	5.0	5.0	0.016	U
7005-72-3	4-Chlorophenyl Phenyl Ether	1	5.0	5.0	0.016	U
218-01-9	Chrysene	1	5.0	5.0	0.020	U
53-70-3	Dibenz(a,h)anthracene	1	5.0	5.0	0.026	U
132-64-9	Dibenzofuran	1	5.0	5.0	0.016	U
84-74-2	Di-n-butyl Phthalate	1	5.0	5.0	0.38	U
91-94-1	3,3'-Dichlorobenzidine	1	5.0	5.0	0.21	U
120-83-2	2,4-Dichlorophenol	1	5.0	5.0	0.015	U
84-66-2	Diethyl Phthalate	1	0.048	5.0	0.034	J
105-67-9	2,4-Dimethylphenol	1	5.0	5.0	0.33	U
131-11-3	Dimethyl Phthalate	1	5.0	5.0	0.016	U
534-52-1	4,6-Dinitro-2-methylphenol	1	5.0	5.0	0.12	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-05 File ID: 0708362-05.D

Sampled: 08/14/07 14:05 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 13:06

Solids: Preparation: 3510C Liquid-Liquid Extr Initial/Final: 1050 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
51-28-5	2,4-Dinitrophenol	1	10	10	1.5	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.21	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.050	U
117-84-0	Di-n-octyl Phthalate	1	5.0	5.0	0.34	U
117-81-7	Bis(2-ethylhexyl) Phthalate	1	5.0	5.0	0.41	U
206-44-0	Fluoranthene	1	5.0	5.0	0.016	U
86-73-7	Fluorene	1	5.0	5.0	0.011	U
118-74-1	Hexachlorobenzene	1	5.0	5.0	0.019	U
87-68-3	Hexachlorobutadiene	1	5.0	5.0	0.018	U
77-47-4	Hexachlorocyclopentadiene	1	5.0	5.0	0.13	U
67-72-1	Hexachloroethane	1	5.0	5.0	0.038	U
193-39-5	Indeno(1,2,3-cd)pyrene	1	5.0	5.0	0.014	U
78-59-1	Isophorone	1	5.0	5.0	0.031	U
91-57-6	2-Methylnaphthalene	1	5.0	5.0	0.015	U
95-48-7	2-Methylphenol	1	5.0	5.0	0.14	U
106-44-5	4-Methylphenol	1	5.0	5.0	0.16	U
91-20-3	Naphthalene	1	5.0	5.0	0.023	U
88-74-4	2-Nitroaniline	1	5.0	5.0	0.12	U
99-09-2	3-Nitroaniline	1	5.0	5.0	0.13	U
100-01-6	4-Nitroaniline	1	5.0	5.0	0.14	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.026	U
100-02-7	4-Nitrophenol	1	10	10	1.3	U
88-75-5	2-Nitrophenol	1	5.0	5.0	0.026	U
86-30-6	N-Nitroso-diphenylamine	1	5.0	5.0	0.019	U
621-64-7	N-Nitroso-di-n-propylamine	1	5.0	5.0	0.030	U
87-86-5	Pentachlorophenol	1	10	10	0.19	U
85-01-8	Phenanthrene	1	5.0	5.0	0.015	U
108-95-2	Phenol	1	5.0	5.0	0.028	U
129-00-0	Pyrene	1	5.0	5.0	0.047	U
95-94-3	1,2,4,5-Tetrachlorobenzene	1	5.0	5.0	0.024	U
58-90-2	2,3,4,6-Tetrachlorophenol	1	5.0	5.0	0.16	U
88-06-2	2,4,6-Trichlorophenol	1	5.0	5.0	0.027	U
95-95-4	2,4,5-Trichlorophenol	1	5.0	5.0	0.11	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q

00326

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-05 File ID: 0708362-05.D

Sampled: 08/14/07 14:05 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 13:06

Solids: Preparation: 3510C Liquid-Liquid Extı Initial/Final: 1050 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
2-Fluorophenol	19.0	9.61	50	20 - 110	
Phenol-d6	19.0	6.15	32	10 - 115	
Nitrobenzene-d5	9.52	7.37	77	40 - 110	
2-Fluorobiphenyl	9.52	5.83	61	50 - 110	
2,4,6-Tribromophenol	19.1	13.3	69	40 - 125	
o-Terphenyl	9.52	7.74	81	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	44482	11.799	42581	11.799	
Naphthalene-d8	184433	14.702	172364	14.702	
Acenaphthene-d10	95422	18.758	90451	18.758	
Phenanthrene-d10	142047	21.306	130988	21.311	
Chrysene-d12	119391	25.187	113027	25.193	
Perylene-d12	104342	28.784	95944	28.789	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

40MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-01 File ID: 0708363-01.D

Sampled: 08/14/07 19:40 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 13:49

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
83-32-9	Acenaphthene	1	5.0	5.0	0.013	U
208-96-8	Acenaphthylene	1	5.0	5.0	0.012	U
98-86-2	Acetophenone	1	5.0	5.0	0.043	U
120-12-7	Anthracene	1	5.0	5.0	0.014	U
1912-24-9	Atrazine	1	5.0	5.0	0.026	U
100-52-7	Benzaldehyde	1	5.0	5.0	0.051	U
56-55-3	Benzo(a)anthracene	1	5.0	5.0	0.037	U
50-32-8	Benzo(a)pyrene	1	5.0	5.0	0.023	U
205-99-2	Benzo(b)fluoranthene	1	5.0	5.0	0.040	U
207-08-9	Benzo(k)fluoranthene	1	5.0	5.0	0.036	U
191-24-2	Benzo(g,h,i)perylene	1	5.0	5.0	0.022	U
92-52-4	1,1'-Biphenyl	1	5.0	5.0	0.015	U
101-55-3	4-Bromophenyl Phenyl Ether	1	5.0	5.0	0.026	U
85-68-7	Butyl Benzyl Phthalate	1	0.038	5.0	0.029	J B, Z
105-60-2	Caprolactam	1	5.0	5.0	0.14	U UJ, L
86-74-8	Carbazole	1	5.0	5.0	0.018	U
59-50-7	4-Chloro-3-methylphenol	1	5.0	5.0	0.021	U
106-47-8	4-Chloroaniline	1	5.0	5.0	0.021	U
111-91-1	Bis(2-chloroethoxy)methane	1	5.0	5.0	0.016	U
111-44-4	Bis(2-chloroethyl) Ether	1	5.0	5.0	0.016	U
108-60-1	Bis(2-chloroisopropyl) Ether	1	5.0	5.0	0.047	U
91-58-7	2-Chloronaphthalene	1	5.0	5.0	0.012	U
95-57-8	2-Chlorophenol	1	5.0	5.0	0.016	U
7005-72-3	4-Chlorophenyl Phenyl Ether	1	5.0	5.0	0.016	U
218-01-9	Chrysene	1	5.0	5.0	0.020	U
53-70-3	Dibenz(a,h)anthracene	1	5.0	5.0	0.026	U
132-64-9	Dibenzofuran	1	5.0	5.0	0.016	U
84-74-2	Di-n-butyl Phthalate	1	5.0	5.0	0.38	U
91-94-1	3,3'-Dichlorobenzidine	1	5.0	5.0	0.21	U
120-83-2	2,4-Dichlorophenol	1	5.0	5.0	0.015	U
84-66-2	Diethyl Phthalate	1	5.0	5.0	0.034	U
105-67-9	2,4-Dimethylphenol	1	5.0	5.0	0.33	U
131-11-3	Dimethyl Phthalate	1	5.0	5.0	0.016	U
534-52-1	4,6-Dinitro-2-methylphenol	1	5.0	5.0	0.12	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

40MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-01 File ID: 0708363-01.D

Sampled: 08/14/07 19:40 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 13:49

Solids: Preparation: 3510C Liquid-Liquid Extı Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
51-28-5	2,4-Dinitrophenol	1	10	10	1.5	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.21	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.050	U
117-84-0	Di-n-octyl Phthalate	1	5.0	5.0	0.34	U
117-81-7	Bis(2-ethylhexyl) Phthalate	1	5.0	5.0	0.41	U
206-44-0	Fluoranthene	1	5.0	5.0	0.016	U
86-73-7	Fluorene	1	5.0	5.0	0.011	U
118-74-1	Hexachlorobenzene	1	5.0	5.0	0.019	U
87-68-3	Hexachlorobutadiene	1	5.0	5.0	0.018	U
77-47-4	Hexachlorocyclopentadiene	1	5.0	5.0	0.13	U
67-72-1	Hexachloroethane	1	5.0	5.0	0.038	U
193-39-5	Indeno(1,2,3-cd)pyrene	1	5.0	5.0	0.014	U
78-59-1	Isophorone	1	5.0	5.0	0.031	U
91-57-6	2-Methylnaphthalene	1	5.0	5.0	0.015	U
95-48-7	2-Methylphenol	1	5.0	5.0	0.14	U
106-44-5	4-Methylphenol	1	5.0	5.0	0.16	U
91-20-3	Naphthalene	1	5.0	5.0	0.023	U
88-74-4	2-Nitroaniline	1	5.0	5.0	0.12	U
99-09-2	3-Nitroaniline	1	5.0	5.0	0.13	U
100-01-6	4-Nitroaniline	1	5.0	5.0	0.14	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.026	U
100-02-7	4-Nitrophenol	1	10	10	1.3	U
88-75-5	2-Nitrophenol	1	5.0	5.0	0.026	U
86-30-6	N-Nitroso-diphenylamine	1	5.0	5.0	0.019	U
621-64-7	N-Nitroso-di-n-propylamine	1	5.0	5.0	0.030	U
87-86-5	Pentachlorophenol	1	10	10	0.19	U
85-01-8	Phenanthrene	1	5.0	5.0	0.015	U
108-95-2	Phenol	1	5.0	5.0	0.028	U
129-00-0	Pyrene	1	5.0	5.0	0.047	U
95-94-3	1,2,4,5-Tetrachlorobenzene	1	5.0	5.0	0.024	U
58-90-2	2,3,4,6-Tetrachlorophenol	1	5.0	5.0	0.16	U
88-06-2	2,4,6-Trichlorophenol	1	5.0	5.0	0.027	U
95-95-4	2,4,5-Trichlorophenol	1	5.0	5.0	0.11	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q

00335

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

40MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-01 File ID: 0708363-01.D

Sampled: 08/14/07 19:40 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 13:49

Solids: Preparation: 3510C Liquid-Liquid Extr Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
2-Fluorophenol	18.9	9.83	52	20 - 110	
Phenol-d6	18.9	6.21	33	10 - 115	
Nitrobenzene-d5	9.43	7.55	80	40 - 110	
2-Fluorobiphenyl	9.43	6.15	65	50 - 110	
2,4,6-Tribromophenol	19.0	13.1	69	40 - 125	
o-Terphenyl	9.43	7.58	80	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	42314	11.799	42581	11.799	
Naphthalene-d8	173959	14.702	172364	14.702	
Acenaphthene-d10	88063	18.752	90451	18.758	
Phenanthrene-d10	131339	21.305	130988	21.311	
Chrysene-d12	104961	25.187	113027	25.193	
Perylene-d12	92456	28.784	95944	28.789	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

40MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-03 File ID: 0708363-03.D

Sampled: 08/15/07 12:15 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 14:32

Solids: Preparation: 3510C Liquid-Liquid Extn Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
83-32-9	Acenaphthene	1	5.0	5.0	0.013	U
208-96-8	Acenaphthylene	1	5.0	5.0	0.012	U
98-86-2	Acetophenone	1	5.0	5.0	0.043	U
120-12-7	Anthracene	1	5.0	5.0	0.014	U
1912-24-9	Atrazine	1	5.0	5.0	0.026	U
100-52-7	Benzaldehyde	1	5.0	5.0	0.051	U
56-55-3	Benzo(a)anthracene	1	5.0	5.0	0.037	U
50-32-8	Benzo(a)pyrene	1	5.0	5.0	0.023	U
205-99-2	Benzo(b)fluoranthene	1	5.0	5.0	0.040	U
207-08-9	Benzo(k)fluoranthene	1	5.0	5.0	0.036	U
191-24-2	Benzo(g,h,i)perylene	1	5.0	5.0	0.022	U
92-52-4	1,1'-Biphenyl	1	0.028	5.0	0.015	J
101-55-3	4-Bromophenyl Phenyl Ether	1	5.0	5.0	0.026	U
85-68-7	Butyl Benzyl Phthalate	1	5.0	5.0	0.029	U
105-60-2	Caprolactam	1	5.0	5.0	0.14	U UJ, m
86-74-8	Carbazole	1	5.0	5.0	0.018	U
59-50-7	4-Chloro-3-methylphenol	1	5.0	5.0	0.021	U
106-47-8	4-Chloroaniline	1	5.0	5.0	0.021	U
111-91-1	Bis(2-chloroethoxy)methane	1	5.0	5.0	0.016	U
111-44-4	Bis(2-chloroethyl) Ether	1	5.0	5.0	0.016	U
108-60-1	Bis(2-chloroisopropyl) Ether	1	5.0	5.0	0.047	U
91-58-7	2-Chloronaphthalene	1	5.0	5.0	0.012	U
95-57-8	2-Chlorophenol	1	5.0	5.0	0.016	U
7005-72-3	4-Chlorophenyl Phenyl Ether	1	5.0	5.0	0.016	U
218-01-9	Chrysene	1	5.0	5.0	0.020	U
53-70-3	Dibenz(a,h)anthracene	1	5.0	5.0	0.026	U
132-64-9	Dibenzofuran	1	5.0	5.0	0.016	U
84-74-2	Di-n-butyl Phthalate	1	5.0	5.0	0.38	U
91-94-1	3,3'-Dichlorobenzidine	1	5.0	5.0	0.21	U
120-83-2	2,4-Dichlorophenol	1	5.0	5.0	0.015	U
84-66-2	Diethyl Phthalate	1	5.0	5.0	0.034	U
105-67-9	2,4-Dimethylphenol	1	5.0	5.0	0.33	U
131-11-3	Dimethyl Phthalate	1	5.0	5.0	0.016	U
534-52-1	4,6-Dinitro-2-methylphenol	1	5.0	5.0	0.12	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

40MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-03 File ID: 0708363-03.D

Sampled: 08/15/07 12:15 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 14:32

Solids: Preparation: 3510C Liquid-Liquid Extı Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
51-28-5	2,4-Dinitrophenol	1	10	10	1.5	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.21	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.050	U
117-84-0	Di-n-octyl Phthalate	1	5.0	5.0	0.34	U
117-81-7	Bis(2-ethylhexyl) Phthalate	1	5.0	5.0	0.41	U
206-44-0	Fluoranthene	1	5.0	5.0	0.016	U
86-73-7	Fluorene	1	5.0	5.0	0.011	U
118-74-1	Hexachlorobenzene	1	5.0	5.0	0.019	U
87-68-3	Hexachlorobutadiene	1	5.0	5.0	0.018	U
77-47-4	Hexachlorocyclopentadiene	1	5.0	5.0	0.13	U
67-72-1	Hexachloroethane	1	5.0	5.0	0.038	U
193-39-5	Indeno(1,2,3-cd)pyrene	1	5.0	5.0	0.014	U
78-59-1	Isophorone	1	5.0	5.0	0.031	U
91-57-6	2-Methylnaphthalene	1	0.094	5.0	0.015	J
95-48-7	2-Methylphenol	1	5.0	5.0	0.14	U
106-44-5	4-Methylphenol	1	5.0	5.0	0.16	U
91-20-3	Naphthalene	1	0.094	5.0	0.023	J
88-74-4	2-Nitroaniline	1	5.0	5.0	0.12	U
99-09-2	3-Nitroaniline	1	5.0	5.0	0.13	U
100-01-6	4-Nitroaniline	1	5.0	5.0	0.14	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.026	U
100-02-7	4-Nitrophenol	1	10	10	1.3	U
88-75-5	2-Nitrophenol	1	5.0	5.0	0.026	U
86-30-6	N-Nitroso-diphenylamine	1	5.0	5.0	0.019	U
621-64-7	N-Nitroso-di-n-propylamine	1	5.0	5.0	0.030	U
87-86-5	Pentachlorophenol	1	10	10	0.19	U
85-01-8	Phenanthrene	1	5.0	5.0	0.015	U
108-95-2	Phenol	1	5.0	5.0	0.028	U
129-00-0	Pyrene	1	5.0	5.0	0.047	U
95-94-3	1,2,4,5-Tetrachlorobenzene	1	5.0	5.0	0.024	U
58-90-2	2,3,4,6-Tetrachlorophenol	1	5.0	5.0	0.16	U
88-06-2	2,4,6-Trichlorophenol	1	5.0	5.0	0.027	U
95-95-4	2,4,5-Trichlorophenol	1	5.0	5.0	0.11	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

40MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-03 File ID: 0708363-03.D

Sampled: 08/15/07 12:15 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 14:32

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
2-Fluorophenol	18.9	9.26	49	20 - 110	
Phenol-d6	18.9	5.94	32	10 - 115	
Nitrobenzene-d5	9.43	7.51	80	40 - 110	
2-Fluorobiphenyl	9.43	6.03	64	50 - 110	
2,4,6-Tribromophenol	19.0	12.9	68	40 - 125	
o-Terphenyl	9.43	7.70	82	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	42919	11.799	42581	11.799	
Naphthalene-d8	172716	14.702	172364	14.702	
Acenaphthene-d10	89155	18.753	90451	18.758	
Phenanthrene-d10	131631	21.306	130988	21.311	
Chrysene-d12	104112	25.187	113027	25.193	
Perylene-d12	92407	28.789	95944	28.789	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

40MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-03RE1 File ID: 0708363-03RE.D

Sampled: 08/15/07 12:15 Prepared: 08/23/07 07:48 Analyzed: 08/23/07 17:53

Solids: Preparation: 3510C Liquid-Liquid Extı Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082434 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
95-94-3	1,2,4,5-Tetrachlorobenzene	1	5.0	5.0	0.024	~~U~~ UJ

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Nitrobenzene-d5	9.43	7.68	81	40 - 110	
2-Fluorobiphenyl	9.43	7.23	77	50 - 110	
o-Terphenyl	9.43	8.53	90	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	37538	11.799	36610	11.805	
Naphthalene-d8	157006	14.702	148124	14.708	
Acenaphthene-d10	77908	18.758	76585	18.758	
Phenanthrene-d10	119134	21.311	111429	21.311	
Chrysene-d12	93103	25.193	94107	25.193	
Perylene-d12	77833	28.795	77890	28.795	

* Values outside of QC limits

DO NOT USE
RA
9/20/07

00350

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-05 File ID: 0709363-05.D

Sampled: 08/15/07 00:00 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 15:15

Solids: Preparation: 3510C Liquid-Liquid Extr Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
83-32-9	Acenaphthene	1	5.0	5.0	0.013	U
208-96-8	Acenaphthylene	1	5.0	5.0	0.012	U
98-86-2	Acetophenone	1	5.0	5.0	0.043	U
120-12-7	Anthracene	1	5.0	5.0	0.014	U
1912-24-9	Atrazine	1	5.0	5.0	0.026	U
100-52-7	Benzaldehyde	1	5.0	5.0	0.051	U
56-55-3	Benzo(a)anthracene	1	5.0	5.0	0.037	U
50-32-8	Benzo(a)pyrene	1	5.0	5.0	0.023	U
205-99-2	Benzo(b)fluoranthene	1	5.0	5.0	0.040	U
207-08-9	Benzo(k)fluoranthene	1	5.0	5.0	0.036	U
191-24-2	Benzo(g,h,i)perylene	1	5.0	5.0	0.022	U
92-52-4	1,1'-Biphenyl	1	0.038	5.0	0.015	J
101-55-3	4-Bromophenyl Phenyl Ether	1	5.0	5.0	0.026	U
85-68-7	Butyl Benzyl Phthalate	1	5.0	5.0	0.029	U
105-60-2	Caprolactam	1	5.0	5.0	0.14	U UJ, X
86-74-8	Carbazole	1	5.0	5.0	0.018	U
59-50-7	4-Chloro-3-methylphenol	1	5.0	5.0	0.021	U
106-47-8	4-Chloroaniline	1	5.0	5.0	0.021	U
111-91-1	Bis(2-chloroethoxy)methane	1	5.0	5.0	0.016	U
111-44-4	Bis(2-chloroethyl) Ether	1	5.0	5.0	0.016	U
108-60-1	Bis(2-chloroisopropyl) Ether	1	5.0	5.0	0.047	U
91-58-7	2-Chloronaphthalene	1	5.0	5.0	0.012	U
95-57-8	2-Chlorophenol	1	5.0	5.0	0.016	U
7005-72-3	4-Chlorophenyl Phenyl Ether	1	5.0	5.0	0.016	U
218-01-9	Chrysene	1	5.0	5.0	0.020	U
53-70-3	Dibenz(a,h)anthracene	1	5.0	5.0	0.026	U
132-64-9	Dibenzofuran	1	5.0	5.0	0.016	U
84-74-2	Di-n-butyl Phthalate	1	5.0	5.0	0.38	U
91-94-1	3,3'-Dichlorobenzidine	1	5.0	5.0	0.21	U
120-83-2	2,4-Dichlorophenol	1	5.0	5.0	0.015	U
84-66-2	Diethyl Phthalate	1	0.038	5.0	0.034	J B,X
105-67-9	2,4-Dimethylphenol	1	5.0	5.0	0.33	U
131-11-3	Dimethyl Phthalate	1	5.0	5.0	0.016	U
534-52-1	4,6-Dinitro-2-methylphenol	1	5.0	5.0	0.12	U

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-05 File ID: 0709363-05.D

Sampled: 08/15/07 00:00 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 15:15

Solids: Preparation: 3510C Liquid-Liquid Extr Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
51-28-5	2,4-Dinitrophenol	1	10	10	1.5	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.21	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.050	U
117-84-0	Di-n-octyl Phthalate	1	5.0	5.0	0.34	U
117-81-7	Bis(2-ethylhexyl) Phthalate	1	5.0	5.0	0.41	U
206-44-0	Fluoranthene	1	5.0	5.0	0.016	U
86-73-7	Fluorene	1	5.0	5.0	0.011	U
118-74-1	Hexachlorobenzene	1	5.0	5.0	0.019	U
87-68-3	Hexachlorobutadiene	1	5.0	5.0	0.018	U
77-47-4	Hexachlorocyclopentadiene	1	5.0	5.0	0.13	U
67-72-1	Hexachloroethane	1	5.0	5.0	0.038	U
193-39-5	Indeno(1,2,3-cd)pyrene	1	5.0	5.0	0.014	U
78-59-1	Isophorone	1	5.0	5.0	0.031	U
91-57-6	2-Methylnaphthalene	1	0.11	5.0	0.015	J
95-48-7	2-Methylphenol	1	5.0	5.0	0.14	U
106-44-5	4-Methylphenol	1	5.0	5.0	0.16	U
91-20-3	Naphthalene	1	0.10	5.0	0.023	J
88-74-4	2-Nitroaniline	1	5.0	5.0	0.12	U
99-09-2	3-Nitroaniline	1	5.0	5.0	0.13	U
100-01-6	4-Nitroaniline	1	5.0	5.0	0.14	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.026	U
100-02-7	4-Nitrophenol	1	10	10	1.3	U
88-75-5	2-Nitrophenol	1	5.0	5.0	0.026	U
86-30-6	N-Nitroso-diphenylamine	1	5.0	5.0	0.019	U
621-64-7	N-Nitroso-di-n-propylamine	1	5.0	5.0	0.030	U
87-86-5	Pentachlorophenol	1	10	10	0.19	U
85-01-8	Phenanthrene	1	5.0	5.0	0.015	U
108-95-2	Phenol	1	5.0	5.0	0.028	U
129-00-0	Pyrene	1	5.0	5.0	0.047	U
95-94-3	1,2,4,5-Tetrachlorobenzene	1	5.0	5.0	0.024	U
58-90-2	2,3,4,6-Tetrachlorophenol	1	5.0	5.0	0.16	U
88-06-2	2,4,6-Trichlorophenol	1	5.0	5.0	0.027	U
95-95-4	2,4,5-Trichlorophenol	1	5.0	5.0	0.11	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q

00355

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-05 File ID: 0709363-05.D

Sampled: 08/15/07 00:00 Prepared: 08/20/07 07:48 Analyzed: 08/22/07 15:15

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 1 mL

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006 Instrument: 308

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
2-Fluorophenol	18.9	9.24	49	20 - 110	
Phenol-d6	18.9	5.77	31	10 - 115	
Nitrobenzene-d5	9.43	7.64	81	40 - 110	
2-Fluorobiphenyl	9.43	6.58	70	50 - 110	
2,4,6-Tribromophenol	19.0	13.1	69	40 - 125	
o-Terphenyl	9.43	8.03	85	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	41714	11.799	42581	11.799	
Naphthalene-d8	166989	14.701	172364	14.702	
Acenaphthene-d10	84575	18.758	90451	18.758	
Phenanthrene-d10	126576	21.305	130988	21.311	
Chrysene-d12	101646	25.187	113027	25.193	
Perylene-d12	90300	28.783	95944	28.789	

* Values outside of QC limits

SAMPLE ID SUMMARY

USEPA-8081A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-39

Client: URS Corporation

Project: RFAAP SWMU 40

Client Sample Id:	Lab Sample Id:
17MW3	0708362-01
40MW3	0708362-03
EQBK-1	0708362-05
40MW6	0708363-01
40MW5	0708363-03
DUP-1	0708363-05

ANALYSIS DATA SHEET

17MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-01 File ID: A53_438-0

Sampled: 08/13/07 18:05 Prepared: 08/20/07 07:45 Analyzed: 08/28/07 00:41

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0709524 Sequence: 7082926 Calibration: 7H29001 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0019	U
319-85-7	beta-BHC	1	0.050	0.050	0.0032	U
58-89-9	gamma-BHC (Lindane)	1	0.0085	0.050	0.0018	J J, 8
319-86-8	delta-BHC	1	0.10	0.10	0.0023	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0021	U
5103-74-2	gamma-Chlordane	1	0.0057	0.050	0.0021	J
72-54-8	4,4'-DDD	1	0.10	0.10	0.0019	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0027	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0020	U
309-00-2	Aldrin	1	0.050	0.050	0.0079	U
60-57-1	Dieldrin	1	0.050	0.050	0.0020	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0023	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0018	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0033	U
72-20-8	Endrin	1	0.10	0.10	0.0020	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0029	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0033	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0021	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0052	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.166	88	25 - 140	
Decachlorobiphenyl	0.189	0.162	86	30 - 135	

* Values outside of QC limits

ANALYSIS DATA SHEET

40MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-03 File ID: A53_437-0

Sampled: 08/14/07 13:00 Prepared: 08/20/07 07:45 Analyzed: 08/28/07 00:06

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0709524 Sequence: 7082926 Calibration: 7H29001 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0019	U
319-85-7	beta-BHC	1	0.050	0.050	0.0032	U
58-89-9	gamma-BHC (Lindane)	1	0.050	0.050	0.0018	U
319-86-8	delta-BHC	1	0.10	0.10	0.0023	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0021	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0021	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0019	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0027	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0020	U
309-00-2	Aldrin	1	0.050	0.050	0.0079	U
60-57-1	Dieldrin	1	0.050	0.050	0.0020	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0023	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0018	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0033	U
72-20-8	Endrin	1	0.10	0.10	0.0020	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0029	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0033	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0021	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0052	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.161	86	25 - 140	
Decachlorobiphenyl	0.189	0.172	91	30 - 135	

* Values outside of QC limits

ANALYSIS DATA SHEET

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-05 File ID: A53_436-0

Sampled: 08/14/07 14:05 Prepared: 08/20/07 07:45 Analyzed: 08/27/07 23:32

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1050 mL / 2 mL

QC Batch: 0709524 Sequence: 7082926 Calibration: 7H29001 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0019	U
319-85-7	beta-BHC	1	0.050	0.050	0.0032	U
58-89-9	gamma-BHC (Lindane)	1	0.050	0.050	0.0018	U
319-86-8	delta-BHC	1	0.10	0.10	0.0023	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0021	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0021	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0019	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0027	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0020	U
309-00-2	Aldrin	1	0.050	0.050	0.0079	U
60-57-1	Dieldrin	1	0.050	0.050	0.0020	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0023	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0018	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0033	U
72-20-8	Endrin	1	0.10	0.10	0.0020	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0029	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0033	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0021	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0052	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.190	0.166	87	25 - 140	
Decachlorobiphenyl	0.190	0.143	75	30 - 135	

* Values outside of QC limits

ANALYSIS DATA SHEET

40MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-01 File ID: A53_450-0

Sampled: 08/14/07 19:40 Prepared: 08/20/07 07:45 Analyzed: 08/28/07 07:45

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0709524 Sequence: 7082926 Calibration: 7H29001 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0019	U
319-85-7	beta-BHC	1	0.050	0.050	0.0032	U
58-89-9	gamma-BHC (Lindane)	1	0.0098	0.050	0.0018	J J, Y
319-86-8	delta-BHC	1	0.10	0.10	0.0023	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0021	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0021	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0019	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0027	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0020	U
309-00-2	Aldrin	1	0.050	0.050	0.0079	U
60-57-1	Dieldrin	1	0.050	0.050	0.0020	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0023	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0018	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0033	U
72-20-8	Endrin	1	0.10	0.10	0.0020	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0029	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0033	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0021	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0052	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.155	82	25 - 140	
Decachlorobiphenyl	0.189	0.159	84	30 - 135	

* Values outside of QC limits

00540

ANALYSIS DATA SHEET

40MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-03 File ID: A53_448-0

Sampled: 08/15/07 12:15 Prepared: 08/20/07 07:45 Analyzed: 08/28/07 06:35

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0709524 Sequence: 7082926 Calibration: 7H29001 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0019	U
319-85-7	beta-BHC	1	0.050	0.050	0.0032	U
58-89-9	gamma-BHC (Lindane)	1	0.050	0.050	0.0018	U
319-86-8	delta-BHC	1	0.10	0.10	0.0023	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0021	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0021	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0019	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0027	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0020	U
309-00-2	Aldrin	1	0.050	0.050	0.0079	U
60-57-1	Dieldrin	1	0.050	0.050	0.0020	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0023	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0018	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0033	U
72-20-8	Endrin	1	0.10	0.10	0.0020	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0029	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0033	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0021	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0052	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Tetrachloro-m-xylene		0.189	0.158	84	25 - 140	
Decachlorobiphenyl		0.189	0.173	92	30 - 135	

* Values outside of QC limits

ANALYSIS DATA SHEET

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-05 File ID: A53_449-0

Sampled: 08/15/07 00:00 Prepared: 08/20/07 07:45 Analyzed: 08/28/07 07:10

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0709524 Sequence: 7082926 Calibration: 7H29001 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0019	U
319-85-7	beta-BHC	1	0.050	0.050	0.0032	U
58-89-9	gamma-BHC (Lindane)	1	0.050	0.050	0.0018	U
319-86-8	delta-BHC	1	0.10	0.10	0.0023	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0021	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0021	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0019	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0027	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0020	U
309-00-2	Aldrin	1	0.050	0.050	0.0079	U
60-57-1	Dieldrin	1	0.050	0.050	0.0020	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0023	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0018	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0033	U
72-20-8	Endrin	1	0.10	0.10	0.0020	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0029	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0033	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0021	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0052	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.169	90	25 - 140	
Decachlorobiphenyl	0.189	0.185	98	30 - 135	

* Values outside of QC limits

SAMPLE ID SUMMARY

USEPA-8082

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-39

Client: URS Corporation

Project: RFAAP SWMU 40

Client Sample Id:	Lab Sample Id:
17MW3	0708362-01
40MW3	0708362-03
EQBK-1	0708362-05
40MW6	0708363-01
40MW5	0708363-03
DUP-1	0708363-05

00785

ANALYSIS DATA SHEET

17MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-01 File ID: A180264-0

Sampled: 08/13/07 18:05 Prepared: 08/20/07 09:43 Analyzed: 08/21/07 16:14

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0709525 Sequence: 7082213 Calibration: 7H22004 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.050	U
11104-28-2	PCB-1221	1	0.20	0.20	0.068	U
11141-16-5	PCB-1232	1	0.20	0.20	0.031	U
53469-21-9	PCB-1242	1	0.20	0.20	0.035	U
12672-29-6	PCB-1248	1	0.20	0.20	0.040	U
11097-69-1	PCB-1254	1	0.20	0.20	0.034	U
11096-82-5	PCB-1260	1	0.20	0.20	0.034	U
37324-23-5	PCB-1262	1	0.20	0.20	0.022	U
11100-14-4	PCB-1268	1	0.20	0.20	0.049	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Decachlorobiphenyl	0.189	0.177	94	40 - 135	
Tetrachloro-m-xylene	0.189	0.173	91	36 - 114	

* Values outside of QC limits

ANALYSIS DATA SHEET

40MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-03 File ID: A180265-0

Sampled: 08/14/07 13:00 Prepared: 08/20/07 09:43 Analyzed: 08/21/07 16:32

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0709525 Sequence: 7082213 Calibration: 7H22004 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.050	U
11104-28-2	PCB-1221	1	0.20	0.20	0.068	U
11141-16-5	PCB-1232	1	0.20	0.20	0.031	U
53469-21-9	PCB-1242	1	0.20	0.20	0.035	U
12672-29-6	PCB-1248	1	0.20	0.20	0.040	U
11097-69-1	PCB-1254	1	0.20	0.20	0.034	U
11096-82-5	PCB-1260	1	0.20	0.20	0.034	U
37324-23-5	PCB-1262	1	0.20	0.20	0.022	U
11100-14-4	PCB-1268	1	0.20	0.20	0.049	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Decachlorobiphenyl	0.189	0.174	92	40 - 135	
Tetrachloro-m-xylene	0.189	0.173	92	36 - 114	

* Values outside of QC limits

00505

ANALYSIS DATA SHEET

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-05 File ID: A180266-0

Sampled: 08/14/07 14:05 Prepared: 08/20/07 09:43 Analyzed: 08/21/07 16:50

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1050 mL / 2 mL

QC Batch: 0709525 Sequence: 7082213 Calibration: 7H22004 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.050	U
11104-28-2	PCB-1221	1	0.20	0.20	0.068	U
11141-16-5	PCB-1232	1	0.20	0.20	0.031	U
53469-21-9	PCB-1242	1	0.20	0.20	0.035	U
12672-29-6	PCB-1248	1	0.20	0.20	0.040	U
11097-69-1	PCB-1254	1	0.20	0.20	0.034	U
11096-82-5	PCB-1260	1	0.20	0.20	0.034	U
37324-23-5	PCB-1262	1	0.20	0.20	0.022	U
11100-14-4	PCB-1268	1	0.20	0.20	0.049	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.190	0.133	70	40 - 135	
Tetrachloro-m-xylene		0.190	0.169	89	36 - 114	

* Values outside of QC limits

ANALYSIS DATA SHEET

40MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-01 File ID: A180267-0

Sampled: 08/14/07 19:40 Prepared: 08/20/07 09:43 Analyzed: 08/21/07 17:08

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0709525 Sequence: 7082213 Calibration: 7H22004 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.050	U
11104-28-2	PCB-1221	1	0.20	0.20	0.068	U
11141-16-5	PCB-1232	1	0.20	0.20	0.031	U
53469-21-9	PCB-1242	1	0.20	0.20	0.035	U
12672-29-6	PCB-1248	1	0.20	0.20	0.040	U
11097-69-1	PCB-1254	1	0.20	0.20	0.034	U
11096-82-5	PCB-1260	1	0.20	0.20	0.034	U
37324-23-5	PCB-1262	1	0.20	0.20	0.022	U
11100-14-4	PCB-1268	1	0.20	0.20	0.049	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.189	0.175	93	40 - 135	
Tetrachloro-m-xylene		0.189	0.172	91	36 - 114	

* Values outside of QC limits

ANALYSIS DATA SHEET

40MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-03 File ID: A180268-0

Sampled: 08/15/07 12:15 Prepared: 08/20/07 09:43 Analyzed: 08/21/07 17:25

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1060 mL / 2 mL

QC Batch: 0709525 Sequence: 7082213 Calibration: 7H22004 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.050	U
11104-28-2	PCB-1221	1	0.20	0.20	0.068	U
11141-16-5	PCB-1232	1	0.20	0.20	0.031	U
53469-21-9	PCB-1242	1	0.20	0.20	0.035	U
12672-29-6	PCB-1248	1	0.20	0.20	0.040	U
11097-69-1	PCB-1254	1	0.20	0.20	0.034	U
11096-82-5	PCB-1260	1	0.20	0.20	0.034	U
37324-23-5	PCB-1262	1	0.20	0.20	0.022	U
11100-14-4	PCB-1268	1	0.20	0.20	0.049	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.189	0.173	92	40 - 135	
Tetrachloro-m-xylene		0.189	0.164	87	36 - 114	

* Values outside of QC limits

00836

ANALYSIS DATA SHEET

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-05 File ID: A180269-0

Sampled: 08/15/07 00:00 Prepared: 08/20/07 09:43 Analyzed: 08/21/07 17:43

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1060 mL / 2 mL

QC Batch: 0709525 Sequence: 7082213 Calibration: 7H22004 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.050	U
11104-28-2	PCB-1221	1	0.20	0.20	0.068	U
11141-16-5	PCB-1232	1	0.20	0.20	0.031	U
53469-21-9	PCB-1242	1	0.20	0.20	0.035	U
12672-29-6	PCB-1248	1	0.20	0.20	0.040	U
11097-69-1	PCB-1254	1	0.20	0.20	0.034	U
11096-82-5	PCB-1260	1	0.20	0.20	0.034	U
37324-23-5	PCB-1262	1	0.20	0.20	0.022	U
11100-14-4	PCB-1268	1	0.20	0.20	0.049	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Decachlorobiphenyl	0.189	0.171	91	40 - 135	
Tetrachloro-m-xylene	0.189	0.167	89	36 - 114	

* Values outside of QC limits

00845

SAMPLE ID SUMMARY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-39
Client: URS Corporation
Project: RFAAP SWMU 40

Client Sample Id:	Lab Sample Id:
17MW3	0708362-01
40MW3	0708362-03
EQBK-1	0708362-05
40MW6	0708363-01
40MW5	0708363-03
DUP-1	0708363-05

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

17MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-01 File ID: data006-0

Sampled: 08/13/07 18:05 Prepared: 08/20/07 07:49 Analyzed: 08/27/07 11:56

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709527 Sequence: 7082730 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.32	67	29 - 138	

* Values outside of QC limits

01057

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

40MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-03 File ID: data007-0

Sampled: 08/14/07 13:00 Prepared: 08/20/07 07:49 Analyzed: 08/27/07 12:43

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709527 Sequence: 7082730 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.87	75	29 - 138	

* Values outside of QC limits

01079

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-05 File ID: data008-0

Sampled: 08/14/07 14:05 Prepared: 08/20/07 07:49 Analyzed: 08/27/07 13:30

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709527 Sequence: 7082730 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.24	65	29 - 138	

* Values outside of QC limits

01073

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

40MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-01 File ID: data009-0

Sampled: 08/14/07 19:40 Prepared: 08/20/07 07:49 Analyzed: 08/27/07 14:18

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709527 Sequence: 7082730 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.39	68	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

40MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-03 File ID: data010-0

Sampled: 08/15/07 12:15 Prepared: 08/20/07 07:49 Analyzed: 08/27/07 15:05

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709527 Sequence: 7082730 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.34	67	29 - 138	

* Values outside of QC limits

01079

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-05 File ID: data011-0

Sampled: 08/15/07 00:00 Prepared: 08/20/07 07:49 Analyzed: 08/27/07 15:52

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709527 Sequence: 7082730 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.62	56	29 - 138	

* Values outside of QC limits

01082

SAMPLE ID SUMMARY

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-39

Client: URS Corporation

Project: RFAAP SWMU 40

Client Sample Id:	Lab Sample Id:
17MW3	0708362-01
40MW3	0708362-03
EQBK-1	0708362-05
40MW6	0708363-01
40MW5	0708363-03
DUP-1	0708363-05

01144

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

17MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-01 File ID: ata012-0

Sampled: 08/13/07 18:05 Prepared: 08/17/07 07:40 Analyzed: 08/28/07 16:04

Solids: Preparation: 8332 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709523 Sequence: 7082856 Calibration: 7H28022 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.58	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.61	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
1-Nitronaphthalene	3.21	3.09	96	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

40MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708362-03 File ID: ata013-0

Sampled: 08/14/07 13:00 Prepared: 08/17/07 07:40 Analyzed: 08/28/07 16:26

Solids: Preparation: 8332 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709523 Sequence: 7082856 Calibration: 7H28022 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.58	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.61	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
1-Nitronaphthalene	3.21	3.08	96	50 - 150	

* Values outside of QC limits

01159

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0708362-05 File ID: ata014-0

Sampled: 08/14/07 14:05 Prepared: 08/17/07 07:40 Analyzed: 08/28/07 16:48

Solids: Preparation: 8332 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709523 Sequence: 7082856 Calibration: 7H28022 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.58	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.61	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
1-Nitronaphthalene	3.21	3.07	95	50 - 150	

* Values outside of QC limits

01162

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

40MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-01 File ID: ata015-0

Sampled: 08/14/07 19:40 Prepared: 08/17/07 07:40 Analyzed: 08/28/07 17:11

Solids: Preparation: 8332 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709523 Sequence: 7082856 Calibration: 7H28022 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.58	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.61	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
1-Nitronaphthalene	3.21	3.10	97	50 - 150	

* Values outside of QC limits

01165

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

40MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-03 File ID: ata016-0

Sampled: 08/15/07 12:15 Prepared: 08/17/07 07:40 Analyzed: 08/28/07 17:33

Solids: Preparation: 8332 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709523 Sequence: 7082856 Calibration: 7H28022 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.58	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.61	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
1-Nitronaphthalene	3.21	3.10	96	50 - 150	

* Values outside of QC limits

01158

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39 4MD

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Ground Water Laboratory ID: 0708363-05 File ID: ata017-0

Sampled: 08/15/07 00:00 Prepared: 08/17/07 07:40 Analyzed: 08/28/07 17:55

Solids: Preparation: 8332 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0709523 Sequence: 7082856 Calibration: 7H28022 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.58	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.61	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
1-Nitronaphthalene	3.21	3.17	99	50 - 150	

* Values outside of QC limits

01171

SAMPLE ID SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-39
Client: URS Corporation
Project: RFAAP SWMU 40

Client Sample Id:	Lab Sample Id:
17MW3	0708362-01
40MW3	0708362-03
EQBK-1	0708362-05
40MW6	0708363-01
40MW5	0708363-03
DUP-1	0708363-05

01227

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

17MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/13/07 18:05
Solids: 0.00
Laboratory ID: 0708362-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3010A Digestion
Prepared: 08/22/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709641

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	150	ug/L	1	150	44	U	08/24/07 11:37
7440-70-2	Calcium, Total	100000	ug/L	1	500	40		08/24/07 11:37
7439-89-6	Iron, Total	36	ug/L	1	20	5.7		08/24/07 11:37
7439-95-4	Magnesium, Total	37000	ug/L	1	500	38		08/24/07 11:37
7440-09-7	Potassium, Total	2300	ug/L	1	200	54		08/24/07 11:37
7440-23-5	Sodium, Total	16000	ug/L	1	500	84		08/24/07 11:37

01228

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

17MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/13/07 18:05
Solids: 0.00
Laboratory ID: 0708362-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Prepared: 08/23/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709687

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Dissolved	150	ug/L	1	150	44	U	08/24/07 12:34
7440-70-2	Calcium, Dissolved	100000	ug/L	1	500	40		08/24/07 12:34
7439-89-6	Iron, Dissolved	17	ug/L	1	20	5.7	J	08/24/07 12:35
7439-95-4	Magnesium, Dissolved	36000	ug/L	1	500	38		08/24/07 12:34
7440-09-7	Potassium, Dissolved	2400	ug/L	1	200	54		08/24/07 12:34
7440-23-5	Sodium, Dissolved	16000	ug/L	1	500	84		08/24/07 12:34

01229

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

40MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 13:00
Solids: 0.00
Laboratory ID: 0708362-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3010A Digestion
Prepared: 08/22/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709641

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	150	ug/L	1	150	44	U	08/24/07 11:41
7440-70-2	Calcium, Total	52000	ug/L	1	500	40		08/24/07 11:41
7439-89-6	Iron, Total	21 B,P	ug/L	1	20	5.7		08/24/07 11:42 B,P
7439-95-4	Magnesium, Total	18000	ug/L	1	500	38		08/24/07 11:41
7440-09-7	Potassium, Total	1200	ug/L	1	200	54		08/24/07 11:41
7440-23-5	Sodium, Total	7600	ug/L	1	500	84		08/24/07 11:41

01230

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

40MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 13:00
Solids: 0.00
Laboratory ID: 0708362-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Prepared: 08/23/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709687

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Dissolved	150	ug/L	1	150	44	U	08/24/07 12:39
7440-70-2	Calcium, Dissolved	53000	ug/L	1	500	40		08/24/07 12:39
7439-89-6	Iron, Dissolved	17	ug/L	1	20	5.7	J	08/24/07 12:39
7439-95-4	Magnesium, Dissolved	18000	ug/L	1	500	38		08/24/07 12:39
7440-09-7	Potassium, Dissolved	1200	ug/L	1	200	54		08/24/07 12:39
7440-23-5	Sodium, Dissolved	7800	ug/L	1	500	84		08/24/07 12:39

01231

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 08/14/07 14:05
Solids: 0.00
Laboratory ID: 0708362-05

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3010A Digestion
Prepared: 08/22/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709641

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	150	ug/L	1	150	44	U	08/24/07 11:45	
7440-70-2	Calcium, Total	330	ug/L	1	500	40	J	08/24/07 11:45	
7439-89-6	Iron, Total	15	ug/L	1	20	5.7	J	08/24/07 11:46	B,P
7439-95-4	Magnesium, Total	87	ug/L	1	500	38	J	08/24/07 11:46	B,P
7440-09-7	Potassium, Total	140	ug/L	1	200	54	J	08/24/07 11:45	
7440-23-5	Sodium, Total	500	ug/L	1	500	84	U	08/24/07 11:45	

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

40MW6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 19:40
Solids: 0.00
Laboratory ID: 0708363-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3010A Digestion
Prepared: 08/22/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709641

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	150	ug/L	1	150	44	U	08/24/07 11:49
7440-70-2	Calcium, Total	71000	ug/L	1	500	40		08/24/07 11:49
7439-89-6	Iron, Total	28	ug/L	1	20	5.7		08/24/07 11:50 B|P
7439-95-4	Magnesium, Total	22000	ug/L	1	500	38		08/24/07 11:49
7440-09-7	Potassium, Total	1200	ug/L	1	200	54		08/24/07 11:49
7440-23-5	Sodium, Total	7300	ug/L	1	500	84		08/24/07 11:49

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

40MW6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 19:40
Solids: 0.00
Laboratory ID: 0708363-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Prepared: 08/23/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709687

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Dissolved	150	ug/L	1	150	44	U	08/24/07 12:43
7440-70-2	Calcium, Dissolved	68000	ug/L	1	500	40		08/24/07 12:43
7439-89-6	Iron, Dissolved	15	ug/L	1	20	5.7	J	08/24/07 12:43
7439-95-4	Magnesium, Dissolved	21000	ug/L	1	500	38		08/24/07 12:43
7440-09-7	Potassium, Dissolved	1100	ug/L	1	200	54		08/24/07 12:43
7440-23-5	Sodium, Dissolved	7000	ug/L	1	500	84		08/24/07 12:43

01234

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

40MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 12:15
Solids: 0.00
Laboratory ID: 0708363-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3010A Digestion
Prepared: 08/22/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709641

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	150	ug/L	1	150	44	U	08/24/07 11:54
7440-70-2	Calcium, Total	69000	ug/L	1	500	40		08/24/07 11:54
7439-89-6	Iron, Total	14	ug/L	1	20	5.7	J	08/24/07 11:54
7439-95-4	Magnesium, Total	22000	ug/L	1	500	38		08/24/07 11:54
7440-09-7	Potassium, Total	1000	ug/L	1	200	54		08/24/07 11:54
7440-23-5	Sodium, Total	7000	ug/L	1	500	84		08/24/07 11:54

B,P

01235

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

40MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 12:15
Solids: 0.00
Laboratory ID: 0708363-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Prepared: 08/23/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709687

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Dissolved	150	ug/L	1	150	44	U	08/24/07 12:47
7440-70-2	Calcium, Dissolved	69000	ug/L	5	2500	200		08/24/07 13:26
7439-89-6	Iron, Dissolved	10	ug/L	1	20	5.7	J	08/24/07 12:47
7439-95-4	Magnesium, Dissolved	22000	ug/L	1	500	38		08/24/07 12:47
7440-09-7	Potassium, Dissolved	1000	ug/L	1	200	54		08/24/07 12:47
7440-23-5	Sodium, Dissolved	7000	ug/L	1	500	84		08/24/07 12:47

01235

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 00:00
Solids: 0.00
Laboratory ID: 0708363-05

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3010A Digestion
Prepared: 08/22/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709641

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	150	ug/L	1	150	44	U	08/24/07 12:22
7440-70-2	Calcium, Total	69000	ug/L	1	500	40		08/24/07 12:22
7439-89-6	Iron, Total	11	ug/L	1	20	5.7	J	08/24/07 12:22
7439-95-4	Magnesium, Total	21000	ug/L	1	500	38		08/24/07 12:22
7440-09-7	Potassium, Total	1000	ug/L	1	200	54		08/24/07 12:22
7440-23-5	Sodium, Total	6900	ug/L	1	500	84		08/24/07 12:22

B|P

01237

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 00:00
Solids: 0.00
Laboratory ID: 0708363-05

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Prepared: 08/23/07 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0709687

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Dissolved	150	ug/L	1	150	44	U	08/24/07 13:15
7440-70-2	Calcium, Dissolved	71000	ug/L	1	500	40		08/24/07 13:15
7439-89-6	Iron, Dissolved	9.7	ug/L	1	20	5.7	J	08/24/07 13:15
7439-95-4	Magnesium, Dissolved	22000	ug/L	1	500	38		08/24/07 13:15
7440-09-7	Potassium, Dissolved	1000	ug/L	1	200	54		08/24/07 13:15
7440-23-5	Sodium, Dissolved	6700	ug/L	1	500	84		08/24/07 13:15

01238

SAMPLE ID SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-39

Client: URS Corporation

Project: RFAAP SWMU 40

Client Sample Id:	Lab Sample Id:
17MW3	0708362-01
40MW3	0708362-03
EQBK-1	0708362-05
40MW6	0708363-01
40MW5	0708363-03
DUP-1	0708363-05

01377

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

17MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/13/07 18:05
Solids: 0.00
Laboratory ID: 0708362-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3020A Digestion
Prepared: 08/22/07 07:35
Initial/Final: 25 mL / 125 mL
QC Batch: 0709644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Total	0.56	ug/L	1	3.0	0.44	J	08/24/07 14:32	B,O
7440-38-2	Arsenic, Total	3.0	ug/L	1	3.0	0.74	U	08/24/07 14:32	
7440-39-3	Barium, Total	150	ug/L	1	2.0	0.52		08/24/07 14:32	
7440-41-7	Beryllium, Total	2.0	ug/L	1	2.0	0.31	U	08/24/07 14:32	
7440-43-9	Cadmium, Total	0.20	ug/L	1	0.20	0.062	U	08/24/07 14:32	
7440-47-3	Chromium, Total	5.3	ug/L	1	2.0	0.31		08/24/07 14:32	B,X
7440-48-4	Cobalt, Total	0.42	ug/L	1	1.0	0.096	J	08/24/07 14:32	
7440-50-8	Copper, Total	2.5	ug/L	1	1.0	0.33		08/24/07 14:32	
7439-92-1	Lead, Total	1.0	ug/L	1	1.0	0.33	U	08/24/07 14:32	
7439-96-5	Manganese, Total	1.2	ug/L	1	3.0	0.43	J	08/24/07 14:32	B,X
7440-02-0	Nickel, Total	2.8	ug/L	1	2.0	0.28		08/24/07 14:32	
7782-49-2	Selenium, Total	3.0	ug/L	1	3.0	0.92	U	08/24/07 14:32	
7440-22-4	Silver, Total	0.40	ug/L	1	0.40	0.12	U	08/24/07 14:32	
7440-28-0	Thallium, Total	1.0	ug/L	1	1.0	0.17	U	08/24/07 14:32	
7440-62-2	Vanadium, Total	3.0	ug/L	1	3.0	0.83	U	08/24/07 14:32	
7440-66-6	Zinc, Total	30	ug/L	1	10	0.84		08/24/07 14:32	B,X

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

17MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/13/07 18:05
Solids: 0.00
Laboratory ID: 0708362-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Prepared: 08/23/07 07:30
Initial/Final: 25 mL / 125 mL
QC Batch: 0709686

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Dissolved	3.0	ug/L	1	3.0	0.44	U	08/24/07 13:00	
7440-38-2	Arsenic, Dissolved	3.0	ug/L	1	3.0	0.74	U	08/24/07 13:00	
7440-39-3	Barium, Dissolved	150	ug/L	1	2.0	0.52		08/24/07 13:00	
7440-41-7	Beryllium, Dissolved	2.0	ug/L	1	2.0	0.31	U	08/24/07 13:00	
7440-43-9	Cadmium, Dissolved	0.20	ug/L	1	0.20	0.062	U	08/24/07 13:00	
7440-47-3	Chromium, Dissolved	1.7	ug/L	1	2.0	0.31	J	08/27/07 13:38	B,P
7440-48-4	Cobalt, Dissolved	0.45	ug/L	1	1.0	0.096	J	08/24/07 13:00	
7440-50-8	Copper, Dissolved	1.9	ug/L	1	1.0	0.33		08/24/07 13:00	
7439-92-1	Lead, Dissolved	1.0	ug/L	1	1.0	0.33	U	08/24/07 13:00	
7439-96-5	Manganese, Dissolved	0.69	ug/L	1	3.0	0.43	J	08/24/07 13:00	
7440-02-0	Nickel, Dissolved	1.9	ug/L	1	2.0	0.28	J	08/24/07 13:00	
7782-49-2	Selenium, Dissolved	3.0	ug/L	1	3.0	0.92	U	08/24/07 13:00	
7440-22-4	Silver, Dissolved	0.40	ug/L	1	0.40	0.12	U	08/24/07 13:00	
7440-28-0	Thallium, Dissolved	1.0	ug/L	1	1.0	0.17	U	08/24/07 13:00	
7440-62-2	Vanadium, Dissolved	3.0	ug/L	1	3.0	0.83	U	08/24/07 13:00	
7440-66-6	Zinc, Dissolved	7.5	ug/L	1	10	0.84	JB	08/24/07 13:00	B,P

01379

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

40MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 13:00
Solids: 0.00
Laboratory ID: 0708362-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3020A Digestion
Prepared: 08/22/07 07:35
Initial/Final: 25 mL / 125 mL
QC Batch: 0709644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Total	3.0	ug/L	1	3.0	0.44	U	08/24/07 14:41	
7440-38-2	Arsenic, Total	3.0	ug/L	1	3.0	0.74	U	08/24/07 14:41	
7440-39-3	Barium, Total	29	ug/L	1	2.0	0.52		08/24/07 14:41	
7440-41-7	Beryllium, Total	2.0	ug/L	1	2.0	0.31	U	08/24/07 14:41	
7440-43-9	Cadmium, Total	0.20	ug/L	1	0.20	0.062	U	08/24/07 14:41	
7440-47-3	Chromium, Total	1.7	ug/L	1	2.0	0.31	J	08/27/07 17:35	B,X
7440-48-4	Cobalt, Total	0.16	ug/L	1	1.0	0.096	J	08/24/07 14:41	
7440-50-8	Copper, Total	1.3	ug/L	1	1.0	0.33		08/24/07 14:41	
7439-92-1	Lead, Total	0.51	ug/L	1	1.0	0.33	J	08/24/07 14:41	B,X
7439-96-5	Manganese, Total	0.48	ug/L	1	3.0	0.43	J	08/24/07 14:41	B,X
7440-02-0	Nickel, Total	1.8	ug/L	1	2.0	0.28	J	08/24/07 14:41	
7782-49-2	Selenium, Total	3.0	ug/L	1	3.0	0.92	U	08/24/07 14:41	
7440-22-4	Silver, Total	0.40	ug/L	1	0.40	0.12	U	08/24/07 14:41	
7440-28-0	Thallium, Total	1.0	ug/L	1	1.0	0.17	U	08/24/07 14:41	
7440-62-2	Vanadium, Total	3.0	ug/L	1	3.0	0.83	U	08/24/07 14:41	
7440-66-6	Zinc, Total	15	ug/L	1	10	0.84		08/24/07 14:41	B,X

01350

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

40MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 13:00
Solids: 0.00
Laboratory ID: 0708362-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Prepared: 08/23/07 07:30
Initial/Final: 25 mL / 125 mL
QC Batch: 0709686

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Dissolved	3.0	ug/L	1	3.0	0.44	U	08/24/07 13:04	
7440-38-2	Arsenic, Dissolved	3.0	ug/L	1	3.0	0.74	U	08/24/07 13:04	
7440-39-3	Barium, Dissolved	29	ug/L	1	2.0	0.52		08/24/07 13:04	
7440-41-7	Beryllium, Dissolved	2.0	ug/L	1	2.0	0.31	U	08/24/07 13:04	
7440-43-9	Cadmium, Dissolved	0.20	ug/L	1	0.20	0.062	U	08/24/07 13:04	
7440-47-3	Chromium, Dissolved	1.2	ug/L	1	2.0	0.31	J	08/27/07 13:41	B,P
7440-48-4	Cobalt, Dissolved	0.30	ug/L	1	1.0	0.096	J	08/24/07 13:04	
7440-50-8	Copper, Dissolved	0.86	ug/L	1	1.0	0.33	J	08/24/07 13:04	
7439-92-1	Lead, Dissolved	1.0	ug/L	1	1.0	0.33	U	08/24/07 13:04	
7439-96-5	Manganese, Dissolved	3.0	ug/L	1	3.0	0.43	U	08/24/07 13:04	
7440-02-0	Nickel, Dissolved	1.3	ug/L	1	2.0	0.28	J	08/24/07 13:04	
7782-49-2	Selenium, Dissolved	1.3	ug/L	1	3.0	0.92	J	08/24/07 13:04	B,O
7440-22-4	Silver, Dissolved	0.40	ug/L	1	0.40	0.12	U	08/24/07 13:04	
7440-28-0	Thallium, Dissolved	1.0	ug/L	1	1.0	0.17	U	08/24/07 13:04	
7440-62-2	Vanadium, Dissolved	3.0	ug/L	1	3.0	0.83	U	08/24/07 13:04	
7440-66-6	Zinc, Dissolved	4.5	ug/L	1	10	0.84	JB	08/24/07 13:04	B,P

01381

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

EQBK-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 08/14/07 14:05
Solids: 0.00
Laboratory ID: 0708362-05

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3020A Digestion
Prepared: 08/22/07 07:35
Initial/Final: 25 mL / 125 mL
QC Batch: 0709644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	3.0	ug/L	1	3.0	0.44	U	08/24/07 14:46
7440-38-2	Arsenic, Total	3.0	ug/L	1	3.0	0.74	U	08/24/07 14:46
7440-39-3	Barium, Total	2.0	ug/L	1	2.0	0.52	U	08/24/07 14:46
7440-41-7	Beryllium, Total	2.0	ug/L	1	2.0	0.31	U	08/24/07 14:46
7440-43-9	Cadmium, Total	0.20	ug/L	1	0.20	0.062	U	08/24/07 14:46
7440-47-3	Chromium, Total	1.3	ug/L	1	2.0	0.31	J	08/24/07 14:46
7440-48-4	Cobalt, Total	1.0	ug/L	1	1.0	0.096	U	08/24/07 14:46
7440-50-8	Copper, Total	1.0	ug/L	1	1.0	0.33	U	08/24/07 14:46
7439-92-1	Lead, Total	0.80	ug/L	1	1.0	0.33	J	08/24/07 14:46
7439-96-5	Manganese, Total	0.69	ug/L	1	3.0	0.43	J	08/24/07 14:46
7440-02-0	Nickel, Total	2.0	ug/L	1	2.0	0.28	U	08/24/07 14:46
7782-49-2	Selenium, Total	3.0	ug/L	1	3.0	0.92	U	08/24/07 14:46
7440-22-4	Silver, Total	0.40	ug/L	1	0.40	0.12	U	08/24/07 14:46
7440-28-0	Thallium, Total	1.0	ug/L	1	1.0	0.17	U	08/24/07 14:46
7440-62-2	Vanadium, Total	3.0	ug/L	1	3.0	0.83	U	08/24/07 14:46
7440-66-6	Zinc, Total	27	ug/L	1	10	0.84		08/24/07 14:46

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

40MW6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 19:40
Solids: 0.00
Laboratory ID: 0708363-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3020A Digestion
Prepared: 08/22/07 07:35
Initial/Final: 25 mL / 125 mL
QC Batch: 0709644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Total	3.0	ug/L	1	3.0	0.44	U	08/24/07 14:50	
7440-38-2	Arsenic, Total	3.0	ug/L	1	3.0	0.74	U	08/24/07 14:50	
7440-39-3	Barium, Total	39	ug/L	1	2.0	0.52		08/24/07 14:50	
7440-41-7	Beryllium, Total	2.0	ug/L	1	2.0	0.31	U	08/24/07 14:50	
7440-43-9	Cadmium, Total	0.20	ug/L	1	0.20	0.062	U	08/24/07 14:50	
7440-47-3	Chromium, Total	5.0	ug/L	1	2.0	0.31		08/27/07 17:37	B3X
7440-48-4	Cobalt, Total	0.30	ug/L	1	1.0	0.096	J	08/24/07 14:50	
7440-50-8	Copper, Total	1.0	ug/L	1	1.0	0.33		08/24/07 14:50	
7439-92-1	Lead, Total	1.0	ug/L	1	1.0	0.33	U	08/24/07 14:50	
7439-96-5	Manganese, Total	3.0	ug/L	1	3.0	0.43	U	08/24/07 14:50	
7440-02-0	Nickel, Total	2.1	ug/L	1	2.0	0.28		08/24/07 14:50	
7782-49-2	Selenium, Total	3.0	ug/L	1	3.0	0.92	U	08/24/07 14:50	
7440-22-4	Silver, Total	0.40	ug/L	1	0.40	0.12	U	08/24/07 14:50	
7440-28-0	Thallium, Total	1.0	ug/L	1	1.0	0.17	U	08/24/07 14:50	
7440-62-2	Vanadium, Total	3.0	ug/L	1	3.0	0.83	U	08/24/07 14:50	
7440-66-6	Zinc, Total	15	ug/L	1	10	0.84		08/24/07 14:50	B3X

61363

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

40MW6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 19:40
Solids: 0.00
Laboratory ID: 0708363-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Prepared: 08/23/07 07:30
Initial/Final: 25 mL / 125 mL
QC Batch: 0709686

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Dissolved	3.0	ug/L	1	3.0	0.44	U	08/24/07 13:08	
7440-38-2	Arsenic, Dissolved	3.0	ug/L	1	3.0	0.74	U	08/24/07 13:08	
7440-39-3	Barium, Dissolved	39	ug/L	1	2.0	0.52		08/24/07 13:08	
7440-41-7	Beryllium, Dissolved	2.0	ug/L	1	2.0	0.31	U	08/24/07 13:08	
7440-43-9	Cadmium, Dissolved	0.20	ug/L	1	0.20	0.062	U	08/24/07 13:08	
7440-47-3	Chromium, Dissolved	1.3	ug/L	1	2.0	0.31	J	08/27/07 13:43	B, P
7440-48-4	Cobalt, Dissolved	0.30	ug/L	1	1.0	0.096	J	08/24/07 13:08	
7440-50-8	Copper, Dissolved	0.91	ug/L	1	1.0	0.33	J	08/24/07 13:08	
7439-92-1	Lead, Dissolved	1.0	ug/L	1	1.0	0.33	U	08/24/07 13:08	
7439-96-5	Manganese, Dissolved	3.0	ug/L	1	3.0	0.43	U	08/24/07 13:08	
7440-02-0	Nickel, Dissolved	1.8	ug/L	1	2.0	0.28	J	08/24/07 13:08	
7782-49-2	Selenium, Dissolved	1.1	ug/L	1	3.0	0.92	J	08/24/07 13:08	B, O
7440-22-4	Silver, Dissolved	0.40	ug/L	1	0.40	0.12	U	08/24/07 13:08	
7440-28-0	Thallium, Dissolved	1.0	ug/L	1	1.0	0.17	U	08/24/07 13:08	
7440-62-2	Vanadium, Dissolved	3.0	ug/L	1	3.0	0.83	U	08/24/07 13:08	
7440-66-6	Zinc, Dissolved	4.7	ug/L	1	10	0.84	JB	08/24/07 13:08	B, P

013614

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

40MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 12:15
Solids: 0.00
Laboratory ID: 0708363-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3020A Digestion
Prepared: 08/22/07 07:35
Initial/Final: 25 mL / 125 mL
QC Batch: 0709644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Total	3.0	ug/L	1	3.0	0.44	U	08/24/07 15:13	
7440-38-2	Arsenic, Total	3.0	ug/L	1	3.0	0.74	U	08/24/07 15:13	
7440-39-3	Barium, Total	45	ug/L	1	2.0	0.52		08/24/07 15:13	
7440-41-7	Beryllium, Total	2.0	ug/L	1	2.0	0.31	U	08/24/07 15:13	
7440-43-9	Cadmium, Total	0.20	ug/L	1	0.20	0.062	U	08/24/07 15:13	
7440-47-3	Chromium, Total	1.9	ug/L	1	2.0	0.31	J	08/24/07 15:13	B,X
7440-48-4	Cobalt, Total	0.13	ug/L	1	1.0	0.096	J	08/24/07 15:13	
7440-50-8	Copper, Total	0.79	ug/L	1	1.0	0.33	J	08/24/07 15:13	
7439-92-1	Lead, Total	1.0	ug/L	1	1.0	0.33	U	08/24/07 15:13	
7439-96-5	Manganese, Total	3.0	ug/L	1	3.0	0.43	U	08/24/07 15:13	
7440-02-0	Nickel, Total	1.0	ug/L	1	2.0	0.28	J	08/24/07 15:13	
7782-49-2	Selenium, Total	1.4	ug/L	1	3.0	0.92	J	08/24/07 15:13	B,O
7440-22-4	Silver, Total	0.40	ug/L	1	0.40	0.12	U	08/24/07 15:13	
7440-28-0	Thallium, Total	1.0	ug/L	1	1.0	0.17	U	08/24/07 15:13	
7440-62-2	Vanadium, Total	3.0	ug/L	1	3.0	0.83	U	08/24/07 15:13	
7440-66-6	Zinc, Total	11	ug/L	1	10	0.84		08/24/07 15:13	B,X

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

40MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 12:15
Solids: 0.00
Laboratory ID: 0708363-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Prepared: 08/23/07 07:30
Initial/Final: 25 mL / 125 mL
QC Batch: 0709686

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Dissolved	3.0	ug/L	1	3.0	0.44	U	08/24/07 13:13	
7440-38-2	Arsenic, Dissolved	3.0	ug/L	1	3.0	0.74	U	08/24/07 13:13	
7440-39-3	Barium, Dissolved	46	ug/L	1	2.0	0.52		08/24/07 13:13	
7440-41-7	Beryllium, Dissolved	2.0	ug/L	1	2.0	0.31	U	08/24/07 13:13	
7440-43-9	Cadmium, Dissolved	0.20	ug/L	1	0.20	0.062	U	08/24/07 13:13	
7440-47-3	Chromium, Dissolved	1.4	ug/L	1	2.0	0.31	J	08/27/07 13:46	B, P
7440-48-4	Cobalt, Dissolved	0.31	ug/L	1	1.0	0.096	J	08/24/07 13:13	
7440-50-8	Copper, Dissolved	0.98	ug/L	1	1.0	0.33	J	08/24/07 13:13	
7439-92-1	Lead, Dissolved	1.0	ug/L	1	1.0	0.33	U	08/24/07 13:13	
7439-96-5	Manganese, Dissolved	3.0	ug/L	1	3.0	0.43	U	08/24/07 13:13	
7440-02-0	Nickel, Dissolved	0.49	ug/L	1	2.0	0.28	J	08/24/07 13:13	
7782-49-2	Selenium, Dissolved	3.0	ug/L	1	3.0	0.92	U	08/24/07 13:13	
7440-22-4	Silver, Dissolved	0.40	ug/L	1	0.40	0.12	U	08/24/07 13:13	
7440-28-0	Thallium, Dissolved	1.0	ug/L	1	1.0	0.17	U	08/24/07 13:13	
7440-62-2	Vanadium, Dissolved	3.0	ug/L	1	3.0	0.83	U	08/24/07 13:13	
7440-66-6	Zinc, Dissolved	3.3	ug/L	1	10	0.84	JB	08/24/07 13:13	B, P

01356

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 00:00
Solids: 0.00
Laboratory ID: 0708363-05

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3020A Digestion
Prepared: 08/22/07 07:35
Initial/Final: 25 mL / 125 mL
QC Batch: 0709644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Total	0.64	ug/L	1	3.0	0.44	J	08/24/07 15:41	B,O
7440-38-2	Arsenic, Total	3.0	ug/L	1	3.0	0.74	U	08/24/07 15:41	
7440-39-3	Barium, Total	42	ug/L	1	2.0	0.52		08/24/07 15:41	
7440-41-7	Beryllium, Total	2.0	ug/L	1	2.0	0.31	U	08/24/07 15:41	
7440-43-9	Cadmium, Total	0.20	ug/L	1	0.20	0.062	U	08/24/07 15:41	
7440-47-3	Chromium, Total	0.83	ug/L	1	2.0	0.31	J	08/27/07 17:40	B,X
7440-48-4	Cobalt, Total	0.12	ug/L	1	1.0	0.096	J	08/24/07 15:41	
7440-50-8	Copper, Total	0.79	ug/L	1	1.0	0.33	J	08/24/07 15:41	
7439-92-1	Lead, Total	1.0	ug/L	1	1.0	0.33	U	08/24/07 15:41	
7439-96-5	Manganese, Total	3.0	ug/L	1	3.0	0.43	U	08/24/07 15:41	
7440-02-0	Nickel, Total	0.87	ug/L	1	2.0	0.28	J	08/24/07 15:41	
7782-49-2	Selenium, Total	3.0	ug/L	1	3.0	0.92	U	08/24/07 15:41	
7440-22-4	Silver, Total	0.40	ug/L	1	0.40	0.12	U	08/24/07 15:41	
7440-28-0	Thallium, Total	1.0	ug/L	1	1.0	0.17	U	08/24/07 15:41	
7440-62-2	Vanadium, Total	3.0	ug/L	1	3.0	0.83	U	08/24/07 15:41	
7440-66-6	Zinc, Total	10	ug/L	1	10	0.84		08/24/07 15:41	B,X

013387

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 00:00
Solids: 0.00
Laboratory ID: 0708363-05

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Prepared: 08/23/07 07:30
Initial/Final: 25 mL / 125 mL
QC Batch: 0709686

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-36-0	Antimony, Dissolved	3.0	ug/L	1	3.0	0.44	U	08/24/07 13:59	
7440-38-2	Arsenic, Dissolved	3.0	ug/L	1	3.0	0.74	U	08/24/07 13:59	
7440-39-3	Barium, Dissolved	46	ug/L	1	2.0	0.52		08/24/07 13:59	
7440-41-7	Beryllium, Dissolved	2.0	ug/L	1	2.0	0.31	U	08/24/07 13:59	
7440-43-9	Cadmium, Dissolved	0.20	ug/L	1	0.20	0.062	U	08/24/07 13:59	
7440-47-3	Chromium, Dissolved	1.8	ug/L	1	2.0	0.31	J	08/27/07 13:58	B,P
7440-48-4	Cobalt, Dissolved	0.59	ug/L	1	1.0	0.096	J	08/24/07 13:59	
7440-50-8	Copper, Dissolved	0.78	ug/L	1	1.0	0.33	J	08/24/07 13:59	
7439-92-1	Lead, Dissolved	1.0	ug/L	1	1.0	0.33	U	08/24/07 13:59	
7439-96-5	Manganese, Dissolved	0.75	ug/L	1	3.0	0.43	J	08/24/07 13:59	
7440-02-0	Nickel, Dissolved	1.8	ug/L	1	2.0	0.28	J	08/24/07 13:59	
7782-49-2	Selenium, Dissolved	3.0	ug/L	1	3.0	0.92	U	08/24/07 13:59	
7440-22-4	Silver, Dissolved	0.40	ug/L	1	0.40	0.12	U	08/24/07 13:59	
7440-28-0	Thallium, Dissolved	1.0	ug/L	1	1.0	0.17	U	08/24/07 13:59	
7440-62-2	Vanadium, Dissolved	1.9	ug/L	1	3.0	0.83	J	08/24/07 13:59	
7440-66-6	Zinc, Dissolved	2.9	ug/L	1	10	0.84	JB	08/24/07 13:59	B,P

01388

SAMPLE ID SUMMARY

USEPA-7470A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-39

Client: URS Corporation

Project: RFAAP SWMU 40

Client Sample Id:	Lab Sample Id:
17MW3	0708362-01
40MW3	0708362-03
EQBK-1	0708362-05
40MW6	0708363-01
40MW5	0708363-03
DUP-1	0708363-05

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

17MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/13/07 18:05
Solids: 0.00
Laboratory ID: 0708362-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Total
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709884

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.20	ug/L	1	0.20	0.039	U	08/28/07 15:01

01708

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

17MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/13/07 18:05
Solids: 0.00
Laboratory ID: 0708362-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Disso
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709885

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Dissolved	0.20	ug/L	1	0.20	0.039	U	08/28/07 16:23

01709

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

40MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 13:00
Solids: 0.00
Laboratory ID: 0708362-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Total
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709884

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.040	ug/L	1	0.20	0.039	J	08/28/07 15:17

01710

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

40MW3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 13:00
Solids: 0.00
Laboratory ID: 0708362-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Disso
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709885

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Dissolved	0.20	ug/L	1	0.20	0.039	U	08/28/07 16:28

01711

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

EQBK-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 08/14/07 14:05
Solids: 0.00
Laboratory ID: 0708362-05

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Total
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709884

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.20	ug/L	1	0.20	0.039	U	08/28/07 15:22

01712

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

40MW6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 19:40
Solids: 0.00
Laboratory ID: 0708363-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Total
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709884

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.20	ug/L	1	0.20	0.039	U	08/28/07 15:27

01713

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

40MW6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/14/07 19:40
Solids: 0.00
Laboratory ID: 0708363-01

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Disso
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709885

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Dissolved	0.20	ug/L	1	0.20	0.039	U	08/28/07 16:33

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

40MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 12:15
Solids: 0.00
Laboratory ID: 0708363-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Total
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709884

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.20	ug/L	1	0.20	0.039	U	08/28/07 15:32

01715

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

40MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 12:15
Solids: 0.00
Laboratory ID: 0708363-03

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Disso
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709885

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Dissolved	0.20	ug/L	1	0.20	0.039	U	08/28/07 16:38

01715

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 00:00
Solids: 0.00
Laboratory ID: 0708363-05

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Total
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709884

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.20	ug/L	1	0.20	0.039	U	08/28/07 15:47

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Ground Water
Sampled: 08/15/07 00:00
Solids: 0.00
Laboratory ID: 0708363-05

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 7470A Digestion - Disso
Prepared: 08/28/07 10:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0709885

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Dissolved	0.20	ug/L	1	0.20	0.039	U	08/28/07 16:53

01718

DATA VALIDATION WORKSHEET

Volatile Organic Analysis by GC/MS

Reviewer: RA
Date: 9/20/07
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: RFAAP SWMU40
Project Number: 23548 80
Laboratory: TriMatrix
SDG No.: 36440-39
Test Name: VOC
Method No.: 8260B

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If the temperature of the cooler was elevated (> 10 °C) or bubble size in aqueous sample was too big (tiny bubble is OK.), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water? If yes, no dry weight correction is made and make notes in the DV Report.			✓

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were samples preserved on ice for soils and on ice with HCL for aqueous samples?	✓		
2.2	Have any technical holding times (14 days), determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks prepared at the appropriate frequency (every 12 hour period per GCMS, matrix, and level)?	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the [sample]≤ 5X[associated blank]. (or 10 times for the common volatile lab contaminants - methylene chloride, acetone, and 2-butanone)	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If Yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the DV report.	✓		

Notes: MB → acetone 1.53 ug/L Pos<10x B/c in all samples
Trip blank ~~acetone 3.1~~ also pos for acetone B/c
Trip blank 8/14/07 toluene 0.14 ug/L
Pos <5x → B/y all samples

URS

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve?Are at least five standards included in the calibration curve?	Y		
4.2	Was an initial calibration analyzed at the beginning of each analysis?	Y		
4.3	Was a second source calibration verification analyzed for each calibration curve?	Y		
4.4	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	Y		
4.5	Are all calibration standard %RSDs, correlation coefficient, or % drift within the control limits (%RSD <15%, r>0.995 or r^2>0.99; for 2° source: %D<+20%; and for CCC, %D < 20%)?	Y		
For initial calibration: %RSD > 15%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>20% J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 20%, J(+), only. Negative Bias - %D>-20% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				
4.6	Are any CCCs (chloroform, 1,1-DCE, 1,2-DCPA, ethylbenzene, toluene, and vinyl chloride) displaying an RSD greater than 30%? If yes, L(+)/R(-) all associated results.		N	
4.7	Do any SPCC have an RRF low? (<0.10 for chloromethane, 1,1-dichloroethane, and bromoform or <0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane) If yes, L(+)/R(-) all associated results.		N	

Notes:

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	Y		
5.2	Have all samples been analyzed within twelve hours of the BFB tune? If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".	Y		
5.3	Have ion abundance criteria for BFB been met for each instrument used? If no, flag "R".	Y		

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.2	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
	If any system monitoring compound(s) in the volatile fraction is out of specification, there should be a reanalysis to confirm that			
6.3	If No in Section 6.3, is any sample dilution factor greater than 10? DV report should indicate that extraction efficiency/ method			✓
	1 or more <10% / 1 high/low / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high Positives: L / J / J / L / K Non-detects: R / UJ / UJ / UJ / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are %R for LCS/LCSD recoveries outside the QC limits? If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).		✓	
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		✓	

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within +100% or -50% of the mid point calibration standard? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
	For sample results > 5 x RL, use 50% RPD. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 x RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV	✓		

Notes: 40MW5 and DUP-1 RL %RPD
Chloroform 23 23 1 0% OK

11.0 Detection Limit Verification		Yes	No	NA
11.1	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
11.2	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results			✓

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported:			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Notes:

METHOD BLANK DATA SHEET
USEPA-8260B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0709595-BLK1 File ID: BLK0820A.D

Prepared: 08/20/07 09:00 Preparation: 5030B Aqueous Purge & Initial/Final: 5 mL / 5 mL

Analyzed: 08/20/07 10:43 Instrument: 224

QC Batch: 0709595 Sequence: 7082117 Calibration: 7H20010

CAS No.	Analyte	MDL	MRL	Conc. (ug/L)	Q
67-64-1	Acetone	1.2	20	1.53	J
71-43-2	Benzene	0.12	1.0	1.0	U
74-97-5	Bromochloromethane	0.20	1.0	1.0	U
75-27-4	Bromodichloromethane	0.19	1.0	1.0	U
75-25-2	Bromoform	0.23	1.0	1.0	U
74-83-9	Bromomethane	0.19	1.0	1.0	U
75-15-0	Carbon Disulfide	0.28	5.0	5.0	U
56-23-5	Carbon Tetrachloride	0.15	1.0	1.0	U
108-90-7	Chlorobenzene	0.12	1.0	1.0	U
75-00-3	Chloroethane	0.20	1.0	1.0	U
67-66-3	Chloroform	0.061	1.0	1.0	U
74-87-3	Chloromethane	0.060	1.0	1.0	U
110-82-7	Cyclohexane	0.14	5.0	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	0.29	5.0	5.0	U
124-48-1	Dibromochloromethane	0.14	1.0	1.0	U
106-93-4	1,2-Dibromoethane	0.22	1.0	1.0	U
95-50-1	1,2-Dichlorobenzene	0.065	1.0	1.0	U
541-73-1	1,3-Dichlorobenzene	0.12	1.0	1.0	U
106-46-7	1,4-Dichlorobenzene	0.13	1.0	1.0	U
75-71-8	Dichlorodifluoromethane	0.17	1.0	1.0	U
75-34-3	1,1-Dichloroethane	0.076	1.0	1.0	U
107-06-2	1,2-Dichloroethane	0.15	1.0	1.0	U
75-35-4	1,1-Dichloroethene	0.14	1.0	1.0	U
156-59-2	cis-1,2-Dichloroethene	0.17	1.0	1.0	U
156-60-5	trans-1,2-Dichloroethene	0.16	1.0	1.0	U
78-87-5	1,2-Dichloropropane	0.10	1.0	1.0	U
10061-01-5	cis-1,3-Dichloropropene	0.14	1.0	1.0	U
10061-02-6	trans-1,3-Dichloropropene	0.16	1.0	1.0	U
100-41-4	Ethylbenzene	0.13	1.0	1.0	U
591-78-6	2-Hexanone	0.42	10	10	U

0111

Quality Control Results – Volatile Organics by GC/MS

Calibration

All initial instrument calibrations, second source calibration verifications (SCV), and continuing calibration verifications (CCV) were method-compliant for the target analytes.

Method Blank

No target analytes were detected above one-half the RL. In addition, there were no J-level detections with the exception of Acetone (a common laboratory contaminant) in the one method blank.

Surrogates

All surrogate recoveries were in control.

Laboratory Control Samples

Each Laboratory Control Sample was fortified with all target analytes. All recoveries were in control.

Matrix Spikes

Sample 40MW5 was fortified with all target analytes. All recoveries and RPDs were in control.

Sample Results

Please see Section B. All samples were analyzed without the need for dilution.

Corrective Action

No corrective actions were deemed necessary.

Statements of Data Qualification

No statements were generated.

This report shall not be reproduced except in full, without written authorization of TriMatrix Laboratories, Inc.
Individual sample results relate only to the sample tested.

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 4/20/07
DV Level: II III IV
Review Document:
_X_ SW-846
_X_ NFG - Region III Modifications
_X_ Project QAPP/SAP

Project Name: RFAAP SWMU 40
Project Number:
Laboratory: TN Matrix
SDG No.: 360440-39
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water? If yes, no dry weight correction is made and make notes in the DV Report.			✓

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days	✓		
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: Sample 40MW5 was re-extracted one day outside hT, because the MS for this sample was not fortified with 1,2,4,5-tetrachlorobenzene. UJ/h → original should be used.

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per batch)?	✓		
3.2	Do any blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the [sample≤5X[blank] (or 10 times for the common phthalate contaminants).	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.	✓		

Notes: MB → butyl benzyl phthalate 0.05 ug/L pos<10x → B/Z and samples

EQBK-1 acetophenone 0.048 ug/L all NDs ✓
diethyl phthalate 0.048 ug/L <10x → B/X and samples

URS

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve?	✓		
4.2	Was a second source calibration verification analyzed for each calibration curve?	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis?	✓		
4.4	Are all calibration standard %RSD $\leq$15%, r>0.995, or r^2<0.99), second source $\pm$30% or %D($\leq$20%) within the control limits?	✓		
For initial calibration: %RSD > 15% but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>30% J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 20%, J(+), only. Negative Bias - %D>-20% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				
4.5	Are any SPCCs RF < 0.05 and/or CCC >30%? If yes reject all associated data.		✓	

Notes:

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP monitored ions within specification? If no, flag R.	✓		
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune? If no, flag R.	✓		
5.4	Have ion abundance criteria for DFTPP been met for each instrument used? If no, flag R.	✓		

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.2	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
6.3	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			✓
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓
	If No, for 2 or 3 %Rs > UCL, K(+) only; for 2 or 3 %Rs < LCL, but > 10%, L(+)/UL (-); for 2 or 3 %Rs mixed high/low, J(+)/UJ(-); for %R < 10%, L(+)/R(-).			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS/MSD results in conjunction with other QC criteria to determine the need for qualification of the data.			

Notes: The MS/MSD for 40MW5 %Rs < 64% for caprolactam 11%/10%. parent ND → UJ/M

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS outside the QC limits? If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).	✓		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.			✓

Notes: caprolactam 26% < 64%. ~~[illegible]~~ UJ/R based on professional judgement.
2-Chlorophenol 108%/105% all NDs, No action.

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard areas within +100% and -50% of the mid point initail calibration? If No, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration?		✓	
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.	✓		

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Are all analyte duplicate results within control limits (use RPD limits of matrix spikes)? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes:

	40MW5	RL	DUP-1	
1,1-Biphenyl	0.028 J	5	0.038 J	OKV
2-methylnaphthalene	0.094 J	5	0.11 J	OKV
naphthalene	0.094 J		0.1 J	OKV

11.0 Detection Limit Verification		Yes	No	NA
11.1	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported:			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100 %			

Notes:

HOLDING TIME SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Method: Semivolatile Organic Compounds by EPA Method 8270C

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
17MW3	08/13/07	08/15/07		08/20/07	7	7	08/22/07	2	40	
40MW3	08/14/07	08/15/07		08/20/07	6	7	08/22/07	2	40	
EQBK-1	08/14/07	08/15/07		08/20/07	6	7	08/22/07	2	40	
40MW6	08/14/07	08/16/07		08/20/07	6	7	08/22/07	2	40	
40MW5	08/15/07	08/16/07		08/20/07	5	7	08/22/07	2	40	
40MW5	08/15/07	08/16/07		08/23/07	8	7	08/23/07	0	40	*
DUP-1	08/15/07	08/16/07		08/20/07	5	7	08/22/07	2	40	

METHOD BLANK DATA SHEET
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-39

Client: URS Corporation Project: RFAAP SWMU 40

Matrix: Water Laboratory ID: 0709526-BLK1 File ID: 0709526-blk1.D

Prepared: 08/20/07 07:48 Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1000 mL / 1 mL

Analyzed: 08/22/07 10:16 Instrument: 308

QC Batch: 0709526 Sequence: 7082245 Calibration: 7H22006

CAS No.	Analyte	MDL	MRL	Conc. (ug/L)	Q
83-32-9	Acenaphthene	0.013	5.0	5.0	U
208-96-8	Acenaphthylene	0.012	5.0	5.0	U
98-86-2	Acetophenone	0.043	5.0	5.0	U
120-12-7	Anthracene	0.014	5.0	5.0	U
1912-24-9	Atrazine	0.026	5.0	5.0	U
100-52-7	Benzaldehyde	0.051	5.0	5.0	U
56-55-3	Benzo(a)anthracene	0.037	5.0	5.0	U
50-32-8	Benzo(a)pyrene	0.023	5.0	5.0	U
205-99-2	Benzo(b)fluoranthene	0.040	5.0	5.0	U
207-08-9	Benzo(k)fluoranthene	0.036	5.0	5.0	U
191-24-2	Benzo(g,h,i)perylene	0.022	5.0	5.0	U
92-52-4	1,1'-Biphenyl	0.015	5.0	5.0	U
101-55-3	4-Bromophenyl Phenyl Ether	0.026	5.0	5.0	U
85-68-7	Butyl Benzyl Phthalate	0.029	5.0	0.0500	J
105-60-2	Caprolactam	0.14	5.0	5.0	U
86-74-8	Carbazole	0.018	5.0	5.0	U
59-50-7	4-Chloro-3-methylphenol	0.021	5.0	5.0	U
106-47-8	4-Chloroaniline	0.021	5.0	5.0	U
111-91-1	Bis(2-chloroethoxy)methane	0.016	5.0	5.0	U
111-44-4	Bis(2-chloroethyl) Ether	0.016	5.0	5.0	U
108-60-1	Bis(2-chloroisopropyl) Ether	0.047	5.0	5.0	U
91-58-7	2-Chloronaphthalene	0.012	5.0	5.0	U
95-57-8	2-Chlorophenol	0.016	5.0	5.0	U
7005-72-3	4-Chlorophenyl Phenyl Ether	0.016	5.0	5.0	U
218-01-9	Chrysene	0.020	5.0	5.0	U
53-70-3	Dibenz(a,h)anthracene	0.026	5.0	5.0	U
132-64-9	Dibenzofuran	0.016	5.0	5.0	U
84-74-2	Di-n-butyl Phthalate	0.38	5.0	5.0	U
91-94-1	3,3'-Dichlorobenzidine	0.21	5.0	5.0	U
120-83-2	2,4-Dichlorophenol	0.015	5.0	5.0	U

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8270C

40MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3510C Liquid-Liquid Extraction
Initial/Final: 1060 mL / 1 mL

Laboratory ID: 0709526-MS1
QC Batch: 0709526

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Acenaphthene	9.43	ND	8.85	94	45 - 110	ug/L
Acenaphthylene	9.43	ND	8.51	90	50 - 105	ug/L
Acetophenone	9.43	ND	8.16	86	54 - 113	ug/L
Anthracene	9.43	ND	8.79	93	55 - 110	ug/L
Atrazine	9.43	ND	9.23	98	61 - 139	ug/L
Benzaldehyde	9.43	ND	9.79	104	25 - 141	ug/L
Benzo(a)anthracene	9.43	ND	9.01	96	55 - 110	ug/L
Benzo(a)pyrene	9.43	ND	8.71	92	55 - 110	ug/L
Benzo(b)fluoranthene	9.43	ND	8.83	94	45 - 120	ug/L
Benzo(k)fluoranthene	9.43	ND	9.66	102	45 - 125	ug/L
Benzo(g,h,i)perylene	9.43	ND	8.94	95	40 - 125	ug/L
1,1'-Biphenyl	9.43	0.0283	7.67	81	59 - 114	ug/L
4-Bromophenyl Phenyl Ether	9.43	ND	9.48	100	50 - 115	ug/L
Butyl Benzyl Phthalate	9.43	ND	9.66	102	45 - 115	ug/L
Caprolactam	9.43	ND	1.05	11 *	64 - 140	ug/L
Carbazole	9.43	ND	9.52	101	50 - 115	ug/L
4-Chloro-3-methylphenol	9.43	ND	7.88	84	45 - 110	ug/L
4-Chloroaniline	9.43	ND	8.60	91	15 - 110	ug/L
Bis(2-chloroethoxy)methane	9.43	ND	9.07	96	45 - 105	ug/L
Bis(2-chloroethyl) Ether	9.43	ND	9.50	101	35 - 110	ug/L
Bis(2-chloroisopropyl) Ether	9.43	ND	9.58	102	25 - 130	ug/L
2-Chloronaphthalene	9.43	ND	8.71	92	50 - 105	ug/L
2-Chlorophenol	9.43	ND	9.51	101	35 - 105	ug/L
4-Chlorophenyl Phenyl Ether	9.43	ND	9.01	96	50 - 110	ug/L
Chrysene	9.43	ND	8.94	95	55 - 110	ug/L
Dibenz(a,h)anthracene	9.43	ND	9.15	97	40 - 125	ug/L
Dibenzofuran	9.43	ND	8.94	95	55 - 105	ug/L
Di-n-butyl Phthalate	9.43	ND	9.83	104	55 - 115	ug/L
3,3'-Dichlorobenzidine	18.9	ND	15.2	81	20 - 110	ug/L
2,4-Dichlorophenol	9.43	ND	8.57	91	50 - 105	ug/L
Diethyl Phthalate	9.43	ND	9.91	105	40 - 120	ug/L
2,4-Dimethylphenol	9.43	ND	8.00	85	30 - 110	ug/L
Dimethyl Phthalate	9.43	ND	9.56	101	25 - 125	ug/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8270C

40MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3510C Liquid-Liquid Extraction
Initial/Final: 1060 mL / 1 mL

Laboratory ID: 0709526-MSD1
QC Batch: 0709526

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Acenaphthene	9.43	8.70	92	2	30	45 - 110	ug/L
Acenaphthylene	9.43	8.44	90	0.8	30	50 - 105	ug/L
Acetophenone	9.43	7.81	83	4	30	54 - 113	ug/L
Anthracene	9.43	8.52	90	3	30	55 - 110	ug/L
Atrazine	9.43	8.99	95	3	30	61 - 139	ug/L
Benzaldehyde	9.43	9.51	101	3	30	25 - 141	ug/L
Benzo(a)anthracene	9.43	9.10	96	1	30	55 - 110	ug/L
Benzo(a)pyrene	9.43	9.18	97	5	30	55 - 110	ug/L
Benzo(b)fluoranthene	9.43	8.98	95	2	30	45 - 120	ug/L
Benzo(k)fluoranthene	9.43	9.74	103	0.8	30	45 - 125	ug/L
Benzo(g,h,i)perylene	9.43	9.42	100	5	30	40 - 125	ug/L
1,1'-Biphenyl	9.43	7.50	79	2	30	59 - 114	ug/L
4-Bromophenyl Phenyl Ether	9.43	9.18	97	3	30	50 - 115	ug/L
Butyl Benzyl Phthalate	9.43	9.91	105	3	30	45 - 115	ug/L
Caprolactam	9.43	0.943	10 *	10	30	64 - 140	ug/L
Carbazole	9.43	9.59	102	0.8	30	50 - 115	ug/L
4-Chloro-3-methylphenol	9.43	7.91	84	0.4	30	45 - 110	ug/L
4-Chloroaniline	9.43	8.89	94	3	30	15 - 110	ug/L
Bis(2-chloroethoxy)methane	9.43	9.18	97	1	30	45 - 105	ug/L
Bis(2-chloroethyl) Ether	9.43	9.22	98	3	30	35 - 110	ug/L
Bis(2-chloroisopropyl) Ether	9.43	9.13	97	5	30	25 - 130	ug/L
2-Chloronaphthalene	9.43	8.65	92	0.7	30	50 - 105	ug/L
2-Chlorophenol	9.43	9.44	100	0.7	30	35 - 105	ug/L
4-Chlorophenyl Phenyl Ether	9.43	8.99	95	0.2	30	50 - 110	ug/L
Chrysene	9.43	9.28	98	4	30	55 - 110	ug/L
Dibenz(a,h)anthracene	9.43	9.28	98	1	30	40 - 125	ug/L
Dibenzofuran	9.43	8.85	94	1	30	55 - 105	ug/L
Di-n-butyl Phthalate	9.43	9.86	104	0.3	30	55 - 115	ug/L
3,3'-Dichlorobenzidine	18.9	16.1	85	6	30	20 - 110	ug/L
2,4-Dichlorophenol	9.43	8.79	93	3	30	50 - 105	ug/L
Diethyl Phthalate	9.43	9.92	105	0.1	30	40 - 120	ug/L
2,4-Dimethylphenol	9.43	8.00	85	0	30	30 - 110	ug/L
Dimethyl Phthalate	9.43	9.42	100	1	30	25 - 125	ug/L
4,6-Dinitro-2-methylphenol	9.43	6.27	66	5	30	40 - 130	ug/L

LCS / LCS DUPLICATE RECOVERY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3510C Liquid-Liquid Extraction
Initial/Final: 1000 mL / 1 mL

Laboratory ID: 0709526-BS1

QC Batch: 0709526
Sequence: 7082245

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Acenaphthene	10.0	10.0	100	45 - 110	ug/L
Acenaphthylene	10.0	9.70	97	50 - 105	ug/L
Acetophenone	10.0	8.62	86	54 - 113	ug/L
Anthracene	10.0	9.97	100	55 - 110	ug/L
Atrazine	10.0	10.6	106	61 - 139	ug/L
Benzaldehyde	10.0	10.6	106	25 - 141	ug/L
Benzo(a)anthracene	10.0	10.5	105	55 - 110	ug/L
Benzo(a)pyrene	10.0	10.3	103	55 - 110	ug/L
Benzo(b)fluoranthene	10.0	10.9	109	45 - 120	ug/L
Benzo(k)fluoranthene	10.0	11.0	110	45 - 125	ug/L
Benzo(g,h,i)perylene	10.0	10.8	108	40 - 125	ug/L
1,1'-Biphenyl	10.0	8.74	87	59 - 114	ug/L
4-Bromophenyl Phenyl Ether	10.0	10.9	109	50 - 115	ug/L
Butyl Benzyl Phthalate	10.0	11.2	112	45 - 115	ug/L
Caprolactam	10.0	2.57	26 *	64 - 140	ug/L
Carbazole	10.0	11.0	110	50 - 115	ug/L
4-Chloro-3-methylphenol	10.0	9.27	93	45 - 110	ug/L
4-Chloroaniline	10.0	9.81	98	15 - 110	ug/L
Bis(2-chloroethoxy)methane	10.0	10.4	104	45 - 105	ug/L
Bis(2-chloroethyl) Ether	10.0	10.2	102	35 - 110	ug/L
Bis(2-chloroisopropyl) Ether	10.0	10.5	105	25 - 130	ug/L
2-Chloronaphthalene	10.0	9.91	99	50 - 105	ug/L
2-Chlorophenol	10.0	10.8	108 *	35 - 105	ug/L
4-Chlorophenyl Phenyl Ether	10.0	10.4	104	50 - 110	ug/L
Chrysene	10.0	10.5	105	55 - 110	ug/L
Dibenz(a,h)anthracene	10.0	11.1	111	40 - 125	ug/L
Dibenzofuran	10.0	10.1	101	55 - 105	ug/L
Di-n-butyl Phthalate	10.0	11.3	113	55 - 115	ug/L
3,3'-Dichlorobenzidine	20.0	18.5	93	20 - 110	ug/L

STATEMENT OF DATA QUALIFICATIONS

Semivolatile Organic Compounds by EPA Method 8270C

Qualification:	The LCS recovery exceeded the control limit but it was within the marginal exceedance for a compound that is not a project-specific analyte of concern. The result for this analyte in any sample from the associated QC batch is not considered qualified.	
Analysis:	USEPA-8270C	
	0709526-BS1	2-Chlorophenol
Qualification:	The LCS recovery exceeded both the control limit and the marginal exceedance for a compound that is not a project-specific analyte of concern. The result for this analyte in any sample from the associated QC batch is considered qualified.	
Analysis:	USEPA-8270C	
	0709526-BS1	Caprolactam
Qualification:	The EPA hold time for sample pretreatment was exceeded and the sample result(s) are considered estimated.	
Analysis:	USEPA-8270C	
Sample/Analyte:	0708363-03RE1 40MW5	1,2,4,5-Tetrachlorobenzene
	0709526-MS2	1,2,4,5-Tetrachlorobenzene
	0709526-MSD2	1,2,4,5-Tetrachlorobenzene
Qualification:	The MS and/or MSD recovery was outside the control limit. The non-spiked sample result is considered estimated.	
Analysis:	USEPA-8270C	
Sample/Analyte:	0708363-03 40MW5	Caprolactam

Quality Control Results – Semivolatile Organics by GC/MS

Calibration

All initial instrument calibrations, second source calibration verifications (SCV), and continuing calibration verifications (CCV) were method-compliant for the target analytes.

Note: the initial calibration, second source, and continuing summaries list all compounds present in the calibration standards and not just target analytes.

Method Blanks

No target analyte was detected above one-half the RL. Butyl Benzyl Phthalate was detected below one-half the RL.

Surrogates

All surrogate recoveries were in control.

Laboratory Control Samples

The first Laboratory Control Sample were fortified with all target analytes except 1,2,4,5-Tetrachlorobenzene and the second LCS was fortified with 1,2,4,5-Tetrachlorobenzene. All recoveries were in control with the exception of Caprolactam (26%) and 2-Chlorophenol (108%). The recovery for 2-Chlorophenol was within the marginal exceedance allowed for that compound.

Matrix Spikes

Sample 40MW5 was initially fortified with all target analytes except 1,2,4,5-Tetrachlorobenzene. Upon discovery, a second MS/MSD pair was fortified with 1,2,4,5-Tetrachlorobenzene and extracted within twice the hold time. All recoveries and RPDs were in control with the exception of both recoveries (11%, 10%) for Caprolactam. See Narrative Attachment 2 and matrix spike summary forms for details.

Sample Results

Please see Section C. All samples were analyzed without the need for dilution. Sample 40MW5 was re-extracted due to the absence of 1,2,4,5-Tetrachlorobenzene in the initial MS/MSD. Re-extraction of the sample (and MS/MSD) for 1,2,4,5-Tetrachlorobenzene (only) were within twice the extraction hold time. The Client was advised. Given the need for a second MS/MSD, it was necessary to also re-extract (and report results for) the re-extracted sample. Only 1,2,4,5-Tetrachlorobenzene has been reported for the re-extracted sample.

Corrective Action

Aside from the re-extraction of sample 40MW5 and its MS/MSD, as discussed above, no corrective actions were deemed necessary.

Statements of Data Qualification

See Narrative Attachment 2.

This report shall not be reproduced except in full, without written authorization of TriMatrix Laboratories, Inc.
Individual sample results relate only to the sample tested.

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 9/20/07
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
X project QAPP

Project Name: RAAP SWMU40
Project Number:
Laboratory: TriMatrix
SDG No.: 36440-39
Test Name: Pest/PCB
Method No.: 8081/8082

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 ^{o}C, then flag L(+)/UL(-).			
1.5	Do any soil samples contain more than 50% water? If yes, no dry weight correction is made and make notes in the DV Report.			✓

Notes:

2.0 Holding Times

		Yes	No	NA
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were method blanks prepared at the appropriate frequency (one per 20 samples or batch and matrix)?	✓		
3.2	Do any blanks have positive results? If yes, positive sample results should be reported and qualified "B", if the [sample≤5X[blank].		✓	
3.3	Do any field equipment blanks have positive results? If yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve for 1016, 1260, toxaphene, and technical chlordane; and at least one point for the other arochlors reported? If no, flag "R".	✓		
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".	✓		
4.3	Were continuing calibration standards analyzed every 12 hours or twenty samples? If no, flag "R".	✓		
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±15%) or %D(≤15%) within the control limits?	✓		
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>15%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 15%, J(+), only. Negative Bias - %D>-15% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes:

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning, every 12 hours, and at the end of every sequence.	✓		
5.2	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	✓		
5.3	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	✓		
5.4	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	✓		

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Advisory limit: 60-150%.	✓		
6.3	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			✓
6.4	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
1 out	high/low	No action	No action
2 out	2 high same column	K	No action
	2 low same column	L, UL	No action
	mixed same column	J, UJ	No action
	2 high diff columns	J	Not applicable
	2 low diff columns	J, UJ	Not applicable
	mixed diff columns	Professional judgement	Not applicable
3 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	2 high, 1 low	K (2 high)	J (1 low 2nd column)
	2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
	other mixed	J, UJ	Not applicable
4 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	Mixed	J, UJ	Not applicable
If any recovery is >0% and <10% then L(+)/R(-).			
If any recovery is 0% then R(+/-).			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data.			

Notes: Reg 1/ MS/MSD for 40 MWS
Aldrin on confirmation column 167%/184%/140%
Parent ND → No flags

URS

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.2	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 40MW5 - DUP-1 Both NDs ✓

10.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns <40%? If No, J(+).		✓	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes: pest ⇒ 17MW3 gamma-BHC 91.7% } 40% J/g in these samples
40MW16 gamma-BHC 102.5% }

11.0 Data Completeness

		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	✓		
11.1.1	Number of samples: Pest _____ PCB _____			
11.1.2	Number of target compounds in each analysis: PEST _____ PCB _____			
11.1.3	Number of results rejected and not reported: Pest _____ PCB _____			
11.1.4	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = Pest 100% PCB 100%			

Notes:

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8081A

40MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: 3510C Liquid-Liquid Extraction
Initial/Final: 1060 mL / 2 mL

Laboratory ID: 0709524-MS1
QC Batch: 0709524

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
alpha-BHC	0.0755	ND	0.0711	94	60 - 130	ug/L
alpha-BHC [2C]	0.0755	ND	0.0711	94	60 - 130	ug/L
beta-BHC	0.0755	ND	0.0785	104	65 - 125	ug/L
beta-BHC [2C]	0.0755	ND	0.0774	102	65 - 125	ug/L
gamma-BHC (Lindane)	0.0755	ND	0.0826	110	25 - 135	ug/L
gamma-BHC (Lindane) [2C]	0.0755	ND	0.0734	97	25 - 135	ug/L
delta-BHC	0.0755	ND	0.0745	99	45 - 135	ug/L
delta-BHC [2C]	0.0755	ND	0.0766	102	45 - 135	ug/L
alpha-Chlordane	0.0755	ND	0.0736	98	65 - 125	ug/L
alpha-Chlordane [2C]	0.0755	ND	0.0740	98	65 - 125	ug/L
gamma-Chlordane	0.0755	ND	0.0723	96	60 - 125	ug/L
gamma-Chlordane [2C]	0.0755	ND	0.0740	98	60 - 125	ug/L
4,4'-DDD	0.0755	ND	0.0766	102	25 - 150	ug/L
4,4'-DDD [2C]	0.0755	ND	0.0781	104	25 - 150	ug/L
4,4'-DDE	0.0755	ND	0.0740	98	35 - 140	ug/L
4,4'-DDE [2C]	0.0755	ND	0.0749	99	35 - 140	ug/L
4,4'-DDT	0.0755	ND	0.0764	101	45 - 140	ug/L
4,4'-DDT [2C]	0.0755	ND	0.0806	107	45 - 140	ug/L
Aldrin	0.0755	ND	0.0570	76	25 - 140	ug/L
Aldrin [2C]	0.0755	ND	0.126	167 *	25 - 140	ug/L
Dieldrin	0.0755	ND	0.0751	100	60 - 130	ug/L
Dieldrin [2C]	0.0755	ND	0.0779	103	60 - 130	ug/L
Endosulfan I	0.0755	ND	0.0583	77	50 - 110	ug/L
Endosulfan I [2C]	0.0755	ND	0.0609	81	50 - 110	ug/L
Endosulfan II	0.0755	ND	0.0674	89	30 - 130	ug/L
Endosulfan II [2C]	0.0755	ND	0.0691	92	30 - 130	ug/L
Endosulfan Sulfate	0.0755	ND	0.0800	106	55 - 135	ug/L
Endosulfan Sulfate [2C]	0.0755	ND	0.0834	110	55 - 135	ug/L
Endrin	0.0755	ND	0.0766	102	55 - 135	ug/L
Endrin [2C]	0.0755	ND	0.0789	104	55 - 135	ug/L
Endrin Aldehyde	0.0755	ND	0.0825	109	55 - 135	ug/L
Endrin Aldehyde [2C]	0.0755	ND	0.0811	108	55 - 135	ug/L
Endrin Ketone	0.0755	ND	0.0809	107	75 - 125	ug/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8081A

40MW5

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Water

SDG: 36440-39

Project: RFAAP SWMU 40

Preparation: 3510C Liquid-Liquid Extraction

Initial/Final: 1060 mL / 2 mL

Laboratory ID: 0709524-MSD1

QC Batch: 0709524

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
alpha-BHC	0.0755	0.0679	90	5	30	60 - 130	ug/L
alpha-BHC [2C]	0.0755	0.0674	89	5	30	60 - 130	ug/L
beta-BHC	0.0755	0.0736	98	6	30	65 - 125	ug/L
beta-BHC [2C]	0.0755	0.0732	97	6	30	65 - 125	ug/L
gamma-BHC (Lindane)	0.0755	0.0757	100	9	30	25 - 135	ug/L
gamma-BHC (Lindane) [2C]	0.0755	0.0704	93	4	30	25 - 135	ug/L
delta-BHC	0.0755	0.0717	95	4	30	45 - 135	ug/L
delta-BHC [2C]	0.0755	0.0736	98	4	30	45 - 135	ug/L
alpha-Chlordane	0.0755	0.0706	94	4	30	65 - 125	ug/L
alpha-Chlordane [2C]	0.0755	0.0725	96	2	30	65 - 125	ug/L
gamma-Chlordane	0.0755	0.0702	93	3	30	60 - 125	ug/L
gamma-Chlordane [2C]	0.0755	0.0715	95	3	30	60 - 125	ug/L
4,4'-DDD	0.0755	0.0740	98	4	30	25 - 150	ug/L
4,4'-DDD [2C]	0.0755	0.0757	100	3	30	25 - 150	ug/L
4,4'-DDE	0.0755	0.0708	94	4	30	35 - 140	ug/L
4,4'-DDE [2C]	0.0755	0.0726	96	3	30	35 - 140	ug/L
4,4'-DDT	0.0755	0.0753	100	1	30	45 - 140	ug/L
4,4'-DDT [2C]	0.0755	0.0779	103	3	30	45 - 140	ug/L
Aldrin	0.0755	0.0532	70	7	30	25 - 140	ug/L
Aldrin [2C]	0.0755	0.141	186 *	11	30	25 - 140	ug/L
Dieldrin	0.0755	0.0736	98	2	30	60 - 130	ug/L
Dieldrin [2C]	0.0755	0.0747	99	4	30	60 - 130	ug/L
Endosulfan I	0.0755	0.0564	75	3	30	50 - 110	ug/L
Endosulfan I [2C]	0.0755	0.0568	75	7	30	50 - 110	ug/L
Endosulfan II	0.0755	0.0666	88	1	30	30 - 130	ug/L
Endosulfan II [2C]	0.0755	0.0674	89	2	30	30 - 130	ug/L
Endosulfan Sulfate	0.0755	0.0781	104	2	30	55 - 135	ug/L
Endosulfan Sulfate [2C]	0.0755	0.0809	107	3	30	55 - 135	ug/L
Endrin	0.0755	0.0738	98	4	30	55 - 135	ug/L
Endrin [2C]	0.0755	0.0762	101	3	30	55 - 135	ug/L
Endrin Aldehyde	0.0755	0.0789	104	4	30	55 - 135	ug/L
Endrin Aldehyde [2C]	0.0755	0.0796	106	2	30	55 - 135	ug/L
Endrin Ketone	0.0755	0.0792	105	2	30	75 - 125	ug/L
Endrin Ketone [2C]	0.0755	0.0802	106	2	30	75 - 125	ug/L

00493

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 17MW3 LAB SAMPLE # 0708362-01

	COLUMN 1	COLUMN 2
Inst.ID:	199	199
Column:	RTX CLP Pest	RTX CLP Pest2
ID(mm):	0.53	0.53

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
gamm-BHC (Lindane)	1	12.17	12.17	12.23	0.00854	91.7%
	2	11.87	11.82	11.92	0.00317	
gamma-Chlordane	1	16.79	16.76	16.82	0.00573	27.1%
	2	16.65	16.60	16.70	0.00753	

00739

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 40MW6 LAB SAMPLE # 0708363-01

	COLUMN 1	COLUMN 2
Inst.ID:	199	199
Column:	RTX CLP Pest	RTX CLP Pest2
ID(mm):	0.53	0.53

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
gamma-BHC (Lindne)	1	12.17	12.17	12.23	0.00986	102.5%
	2	11.87	11.82	11.92	0.00318	

00740

STATEMENT OF DATA QUALIFICATIONS

Organochlorine Pesticides by EPA Method 8081A

Qualification:	The RPD between the detected values from the primary and confirmation analyses exceeded 40%. The higher concentration result has been reported.	
Analysis:	USEPA-8081A	
Sample/Analyte:	0708362-01 17MW3	gamma-BHC (Lindane)
	0708363-01 40MW6	gamma-BHC (Lindane)
Qualification:	Aldrin exceeded the upper control limit for the MS/MSD on the confirmation column. Original sample has a contamination (non-confirming) peak for Aldrin on the confirmation column causing high recovers in the MS/MSD. No qualification is necessary.	
Analysis:	USEPA-8081A	
	0709524-MS1	Aldrin [2C]
	0709524-MSD1	Aldrin [2C]

00021

Quality Control Results – Chlorinated Pesticides

Note: second column (confirmation) data is identified as "compound[2C]".

Calibration

Initial instrument calibrations, second source verification (SCV), and continuing calibration verifications (CCV) for both the primary and confirmation columns were method-compliant for all target analytes (including Toxaphene).

Method Blanks

No target analytes were detected.

Surrogates

All surrogate recoveries were in control for both the primary column and confirmation column runs.

Laboratory Control Samples

Laboratory Control Samples (LCS) were fortified with all target analytes. An LCS and an LCSD for the one multi-component analyte (i.e., Toxaphene) were separately extracted/analyzed. All recoveries (and RPD for Toxaphene) were in control for both the primary column and confirmation column runs.

Matrix Spikes

Sample 40MW5 was fortified with all single component target analytes. Due to sample volume considerations, a MS/MSD for the one multi-component analyte (i.e., Toxaphene) was not fortified (an LCS/LCSD was substituted). With the exception of Aldrin, all recoveries and RPDs for both the primary column and confirmation column runs were in control. See Narrative Attachment 2 and matrix spike summary forms for details.

Sample Results

Please see Section D. There were one and two J-level detections confirmed for samples 17MW3 and 40MW6, respectively.

Corrective Action

No corrective actions were deemed necessary.

Statements of Data Qualification

See Narrative Attachment 2.

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Individual sample results relate only to the sample tested.

Quality Control Results – Polychlorinated Biphenyls

Note: second column (confirmation) data is identified as "compound[2C]".

Calibration

Initial instrument calibrations, second source verification (SCV), and continuing calibration verifications (CCV) for both the primary and confirmation columns were method-compliant.

Method Blank

No target analytes were detected.

Surrogates

All surrogate recoveries for samples were in control for both the primary column and confirmation column runs.

Laboratory Control Sample

The Laboratory Control Sample (LCS) was fortified with Aroclors 1016 and 1260. Both recoveries were in control.

Matrix Spikes

Sample 40MW5 was fortified with Aroclors 1016 and 1260. All recoveries and RPDs for both the primary column and confirmation column runs were in control.

Sample Results

Please see Section E. No analytes were detected.

Corrective Action

No corrective actions were deemed necessary.

Statements of Data Qualification

No statements were generated.

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DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 9/20/07
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
_X__ SW-846
_X__ Project QAPP/SAP

Project Name: RFAAP SWMU 40
Project Number:
Laboratory: TriMatrix
SDG No.: 30440-39
Test Name: Explosives/PETN
Method No.: 8330/8332

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 °C, then flag L(+)/UL(-).			
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve? If no, flag "R".	✓		
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".	✓		
4.3	Were continuing calibration standards analyzed every 12 hours or twenty samples? If no, flag "R".	✓		
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±15%) or %D(≤15%) within the	✓		
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>15%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 15%, J(+), only. Negative Bias - %D>-15% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes:

5.0 Laboratory Control Sample (LCS)		Yes	No	NA
5.1	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.2	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).		✓	
5.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		✓	

Notes:

6.0 Surrogate Recovery					Yes	No	NA
6.1	Are surrogate recoveries within acceptance criteria for all samples and method blanks?				✓		
6.2	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?						✓
6.3	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)						✓
		<10%	low	high			
	Positives	L	L	K			
	Non-detects	R	UL	No action			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional judgement.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes:

Both NDs ✓

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		✓	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	✓		
10.1.1	Number of samples:			
10.1.2	Number of target compounds in each analysis: 14			
10.1.3	Number of results rejected or not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

Quality Control Results – Nitroaromatic Explosives

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications for the primary column were method-compliant.

Note: no confirmations were needed for any sample.

Method Blanks

No target analytes were detected.

Surrogates

All surrogate recoveries were in control.

Laboratory Control Sample

The Laboratory Control Sample (LCS) was fortified with all target analytes. All recoveries were in control.

Matrix Spikes

Sample 40MW5 was fortified with all target analytes. All recoveries and RPDs were in control.

Sample Results

Please see Section F. There were no detections.

Corrective Actions

No corrective actions were deemed necessary.

Statements of Data Qualification

No statements were generated.

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Quality Control Results – PETN and Nitroglycerin

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications for the primary column were method-compliant.

Note: no confirmations were needed for any sample.

Method Blanks

No target analytes were detected.

Surrogates

All surrogate recoveries were in control.

Laboratory Control Sample

The Laboratory Control Sample (LCS) was fortified with all target analytes. All recoveries were in control.

Matrix Spikes

Sample 40MW5 was fortified with all target analytes. All recoveries and RPDs were in control.

Sample Results

Please see Section F. There were no detections.

Corrective Actions

No corrective actions were deemed necessary.

Statements of Data Qualification

No statements were generated.

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DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-39
Project No.: _____

Project Name: SWMU 40
Reviewer: RA
Date: 9/20/07

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓			✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓			✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓			✓				
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)	✓			✓			✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓			✓					

Note: _____

2.0 Holding Time		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓			✓				

Note: _____

URS

3.0 Instrument Calibration

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".	✓			✓			✓					
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).			✓			✓	✓					
3.3	Once per calibration, did a high and low distilled standard recovery within 85-115%? If no, follow 3.6.												
3.4	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓	✓		✓					
3.5	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓			✓					
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP 90%-110%, FOR Hg 80-120%, FOR CN 85-115%.	✓	✓		✓			✓					
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%												
3.7	For ICP & ICPMS, did the CRDL standard recover between 80-120%?	✓			✓								
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K												

Note: _____

4.0 Blanks

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓			✓					
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓			✓					
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓			✓				✓				
	Sample Results > MDL												
	< 5X Blank Contamination B												
4.4	Are there negative blank results with the absolute value > MDL?		✓						✓				
	Sample Results Non-detects > MDL												
	< 5X absolute Blank Contamination UL L												
4.5	Are there reported field blank > ± MDL?	✓			✓				✓				
	Sample Results > MDL												
	< 5X Blank Contamination B												

Note: MB → total Fe, Mg, Na, Diss. Ca, Mg, Na pos < 5x → B, P
6010 → EQBK-1 → Ca, K, all < 5x, Na auth'on, ICB, CCB low level Mg, Na, Fe, > 5x.
6020 → MB → Diss Cr, Zn < 5x → B, P
EQBK-1 → Cr, lead, Mn, Zinc < 5x → B, x ICB, CCB → antimony, Cu, Sb, pos < 5x → B, P and samples

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	✓			✓								
5.2	Are the ICS AB recoveries within 80% - 120%?	✓			✓								
5.3	Are the results for unspiked analytes (in ICS A) < ± RL?	✓			✓								
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			✓						
	If not...												
	Action: Not Spiked Analytes < -MDL L(+)/UL(-)												
	Not Spiked Analytes > MDL K(+)												
	Spiked analytes (ICS AB analytes) < 50% L(+)/R(-)												
	Spiked analytes (ICS AB analytes) 50% - 79% L(+)/UL(-)												
	Spiked analytes (ICS AB analytes) >120% K(+)												

Note:

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓			✓					
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓			✓				

Action:	Solid		Aqueous		
	< LCL	> UCL	< 50%	50% - 79%	> 120%
	L(+)/UL(-)	K(+)	L(+)/R(-)	L(+)/UL(-)	K(+)

Note: _____

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓			✓					
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.	✓											
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	✓			✓			✓					

Note: _____

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓			✓					
8.2	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75-125% for aqueous matrices or lab limits for soil matrices?	✓				✓		✓					
	%R > 125% / 30%< %R < 74% / < 30%												
	Positive: K / L / L												
	Non-detect: None / UL / R												
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.			✓	✓					✓			

Note: MS for 40MW5 7125% for Diss Ca at 151 %. [redacted] Sample result 7 4X spike amt., No action

9.0 Instrument Detection Limits (IDL)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓			✓					

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓			✓								
10.2	Was a five-fold dilution performed?	✓			✓								
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).	✓			✓								

Note:

11.0 Field Duplicate Samples

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓			✓					
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.												
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report	✓			✓			✓					

Note: see attached

12.0 Result Verification/ Internal Standards/ Tune

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?			✓			✓			✓			
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓			✓					
12.3	Were the Internal Standard recoveries within 30-120%	✓			✓								
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	✓											
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	✓											
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	✓											

Note:

13.0 Completeness Calculation

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓			✓					
13.1.1	Number of samples:												
13.1.2	Number of target compounds in each analysis:												
13.1.3	Number of results rejected and not reported:												
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)												
	% Completeness = 100%												

Note:

URS

Page ____ of ____

Job ____ Project No. ____ Sheet ____ of ____

Description ____ Computed by ____ Date ____

____ Checked by ____ Date ____

Reference

Field Dups

Method 6010

	40MW5	DUP-1	RL	%RPD
Total Ca	69000	64000	500	0% OKV
total Fe	14 J	11	20	OKV
total Mg	22000	21000	500	4.7% OKV
total K	1000	1000	200	0% OKV
total Na	7000	6900	500	1.4% OKV

	40MW5	DUP-1	RL	%RPD
Diss Ca	69000	71000	2500	3% OKV
Diss Fe	10 J	9.7 J	20	OKV
Diss Mg	22000	22000	500	0% OKV
Diss K	1000	1000	200	0% OKV
Diss Na	7000	6700	500	4% OKV

URS

Page ____ of ____

Job ____ Project No. ____ Sheet ____ of ____

Description ____ Computed by ____ Date ____

____ Checked by ____ Date ____

Reference

Field DUPs

Method 6020

	40MW5	DUP-1	RL	%RPD
Total Ba	45	42	2	7% OKV
total Cr	1.9 J	0.83 J	2	OKV
total Co	0.13 J	0.12 J	1	OKV
Total Cu	0.79 J	0.79 J	1	OKV
Total Ni	1 J	0.87 J	2	OKV

	40MW5	DUP-1	RL	%RPD
Diss Ba	46	46	2	0% OKV
Diss Co	0.31 J	0.59 J	1	OKV
Diss Cu	0.98 J	0.78 J	1	OKV
Diss Ni	0.49 J	1.8 J	2	OKV
Diss Mn	ND	0.75 J	3	OKV
Diss V	ND	1.9 J	3	OKV

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-39
Client: URS Corporation
Project: RFAAP SWMU 40
Matrix: Water
Laboratory ID: 0709641-BLK1
File ID: 7082404-021
Prepared: 08/22/07 07:30
Preparation: 3010A Digestion
Initial/Final: 25 mL / 25 mL
Analyzed: 08/24/07 11:29
Instrument: 116
QC Batch: 0709641
Sequence: 7082404
Calibration: 7H24009

CAS No.	Analyte	MDL	MRL	Conc. (ug/L)	Q
7429-90-5	Aluminum, Total	44	150	150	U
7440-70-2	Calcium, Total	40	500	500	U
7439-89-6	Iron, Total	5.7	20	6.27	J
7439-95-4	Magnesium, Total	38	500	61.4	J
7440-09-7	Potassium, Total	54	200	200	U
7440-23-5	Sodium, Total	84	500	139	J

Fe $6.27 \times 5 = 31.35$

Mg → 307

Na → 695

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-39
Client: URS Corporation
Project: RFAAP SWMU 40
Matrix: Water
Laboratory ID: 0709687-BLK1
File ID: 7082404-035
Prepared: 08/23/07 07:30
Preparation: General Metals Prep
Initial/Final: 25 mL / 25 mL
Analyzed: 08/24/07 12:26
Instrument: 116
QC Batch: 0709687
Sequence: 7082404
Calibration: 7H24009

CAS No.	Analyte	MDL	MRL	Conc. (ug/L)	Q
7429-90-5	Aluminum, Dissolved	44	150	150	U
7440-70-2	Calcium, Dissolved	40	500	46.7	J
7439-89-6	Iron, Dissolved	5.7	20	20	U
7439-95-4	Magnesium, Dissolved	38	500	53.3	J
7440-09-7	Potassium, Dissolved	54	200	200	U
7440-23-5	Sodium, Dissolved	84	500	182	J

Ca → 223.5
Mg 266.5
Na 910

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 7082404

SDG: 36440-39
Project: RFAAP SWMU 40
Instrument ID: 116
Calibration: 7H24009

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
7082404-ICB1	Aluminum	16.1	150	44	ug/L	U	08/24/07 10:56
	Calcium	0.0250	0.50	0.040	mg/L	U	08/24/07 10:56
	Iron	3.87	20	5.7	ug/L	U	08/24/07 10:56
	Magnesium	0.0497	0.50	0.038	mg/L	J	08/24/07 10:56
	Potassium	-0.00813	0.20	0.054	mg/L	U	08/24/07 10:56
	Sodium	0.0937	0.50	0.084	mg/L	J	08/24/07 10:56
7082404-CCB1	Aluminum	16.6	150	44	ug/L	U	08/24/07 11:25
	Calcium	0.0280	0.50	0.040	mg/L	U	08/24/07 11:25
	Potassium	-0.00167	0.20	0.054	mg/L	U	08/24/07 11:25
	Sodium	0.0850	0.50	0.084	mg/L	J	08/24/07 11:25
	Iron	4.69	20	5.7	ug/L	U	08/24/07 11:25
	Magnesium	0.0483	0.50	0.038	mg/L	J	08/24/07 11:25
0709641-BLK1	Aluminum, Total	150	150	44	ug/L	U	08/24/07 11:29
	Calcium, Total	500	500	40	ug/L	U	08/24/07 11:29
	Potassium, Total	200	200	54	ug/L	U	08/24/07 11:29
	Sodium, Total	139	500	84	ug/L	J	08/24/07 11:29
	Iron, Total	6.27	20	5.7	ug/L	J	08/24/07 11:29
	Magnesium, Total	61.4	500	38	ug/L	J	08/24/07 11:29
7082404-CCB2	Aluminum	8.47	150	44	ug/L	U	08/24/07 12:14
	Calcium	0.0307	0.50	0.040	mg/L	U	08/24/07 12:14
	Potassium	0.0159	0.20	0.054	mg/L	U	08/24/07 12:14
	Sodium	0.0276	0.50	0.084	mg/L	U	08/24/07 12:14
	Iron	3.83	20	5.7	ug/L	U	08/24/07 12:14
	Magnesium	0.0548	0.50	0.038	mg/L	J	08/24/07 12:14
7082404-CCB3	Aluminum	-3.71	150	44	ug/L	U	08/24/07 13:03
	Calcium	0.0274	0.50	0.040	mg/L	U	08/24/07 13:03
	Potassium	0.0236	0.20	0.054	mg/L	U	08/24/07 13:03
	Sodium	-0.0790	0.50	0.084	mg/L	U	08/24/07 13:03
	Iron	7.79	20	5.7	ug/L	J	08/24/07 13:03
	Magnesium	0.0539	0.50	0.038	mg/L	J	08/24/07 13:03
7082404-CCB4	Aluminum	0.292	150	44	ug/L	U	08/24/07 13:42
	Calcium	0.0292	0.50	0.040	mg/L	U	08/24/07 13:42
	Potassium	0.0150	0.20	0.054	mg/L	U	08/24/07 13:42

01247

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 7082404

SDG: 36440-39
Project: RFAAP SWMU 40
Instrument ID: 116
Calibration: 7H24009

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
7082404-CCB4	Sodium	-0.0469	0.50	0.084	mg/L	U	08/24/07 13:42
	Iron	5.68	20	5.7	ug/L	U	08/24/07 13:42
	Magnesium	0.0562	0.50	0.038	mg/L	J	08/24/07 13:42

* Values outside of QC limits

01248

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 7082404

SDG: 36440-39
Project: RFAAP SWMU 40
Instrument ID: 116
Calibration: 7H24009

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
7082404-ICB1	Aluminum	16.1	150	44	ug/L	U	08/24/07 10:53
	Calcium	0.0250	0.50	0.040	mg/L	U	08/24/07 10:56
	Iron	3.87	20	5.7	ug/L	U	08/24/07 10:56
	Magnesium	0.0497	0.50	0.038	mg/L	J	08/24/07 10:56
	Potassium	-0.00813	0.20	0.054	mg/L	U	08/24/07 10:56
	Sodium	0.0937	0.50	0.084	mg/L	J	08/24/07 10:56
7082404-CCB1	Aluminum	16.6	150	44	ug/L	U	08/24/07 11:25
	Calcium	0.0280	0.50	0.040	mg/L	U	08/24/07 11:25
	Potassium	-0.00167	0.20	0.054	mg/L	U	08/24/07 11:25
	Sodium	0.0850	0.50	0.084	mg/L	J	08/24/07 11:25
	Iron	4.69	20	5.7	ug/L	U	08/24/07 11:25
	Magnesium	0.0483	0.50	0.038	mg/L	J	08/24/07 11:25
7082404-CCB2	Aluminum	8.47	150	44	ug/L	U	08/24/07 12:14
	Calcium	0.0307	0.50	0.040	mg/L	U	08/24/07 12:14
	Potassium	0.0159	0.20	0.054	mg/L	U	08/24/07 12:14
	Sodium	0.0276	0.50	0.084	mg/L	U	08/24/07 12:14
	Iron	3.83	20	5.7	ug/L	U	08/24/07 12:14
	Magnesium	0.0548	0.50	0.038	mg/L	J	08/24/07 12:14
0709687-BLK1	Aluminum, Dissolved	150	150	44	ug/L	U	08/24/07 12:26
	Calcium, Dissolved	46.7	500	40	ug/L	J	08/24/07 12:26
	Potassium, Dissolved	200	200	54	ug/L	U	08/24/07 12:26
	Sodium, Dissolved	182	500	84	ug/L	J	08/24/07 12:26
	Iron, Dissolved	20	20	5.7	ug/L	U	08/24/07 12:26
	Magnesium, Dissolved	53.3	500	38	ug/L	J	08/24/07 12:26
7082404-CCB3	Aluminum	-3.71	150	44	ug/L	U	08/24/07 13:03
	Calcium	0.0274	0.50	0.040	mg/L	U	08/24/07 13:03
	Potassium	0.0236	0.20	0.054	mg/L	U	08/24/07 13:03
	Sodium	-0.0790	0.50	0.084	mg/L	U	08/24/07 13:03
	Iron	7.79	20	5.7	ug/L	J	08/24/07 13:03
	Magnesium	0.0539	0.50	0.038	mg/L	J	08/24/07 13:03
7082404-CCB4	Aluminum	0.292	150	44	ug/L	U	08/24/07 13:42
	Calcium	0.0292	0.50	0.040	mg/L	U	08/24/07 13:42
	Potassium	0.0150	0.20	0.054	mg/L	U	08/24/07 13:42

01249

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 7082404

SDG: 36440-39
Project: RFAAP SWMU 40
Instrument ID: 116
Calibration: 7H24009

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
7082404-CCB4	Sodium	-0.0469	0.50	0.084	mg/L	U	08/24/07 13:42
	Iron	5.68	20	5.7	ug/L	U	08/24/07 13:42
	Magnesium	0.0562	0.50	0.038	mg/L	J	08/24/07 13:42

* Values outside of QC limits

01256

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-6010B

40MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

SDG: 36440-39
Project: RFAAP SWMU 40
Preparation: General Metals Prep
Initial/Final: 25 mL / 25 mL

Laboratory ID: 0709687-MS1
QC Batch: 0709687

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Aluminum, Dissolved	1250	ND	1250	100	80 - 120	ug/L
Calcium, Dissolved	12500	69000	87900	151 *	80 - 120	ug/L
Iron, Dissolved	250	10.2	262	101	80 - 120	ug/L
Magnesium, Dissolved	12500	22100	35500	107	80 - 120	ug/L
Potassium, Dissolved	12500	1040	13900	103	80 - 120	ug/L
Sodium, Dissolved	12500	7020	19500	100	80 - 120	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

01253

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-39
Client: URS Corporation
Project: RFAAP SWMU 40
Matrix: Water
Laboratory ID: 0709686-BLK1
File ID: 7082414-057
Prepared: 08/23/07 07:30
Preparation: General Metals Prep
Initial/Final: 25 mL / 125 mL
Analyzed: 08/24/07 15:50
Instrument: 114
QC Batch: 0709686
Sequence: 7082414
Calibration: 7H27002

CAS No.	Analyte	MDL	MRL	Conc. (ug/L)	Q
7440-36-0	Antimony, Dissolved	0.44	3.0	3.0	U
7440-38-2	Arsenic, Dissolved	0.74	3.0	3.0	U
7440-39-3	Barium, Dissolved	0.52	2.0	2.0	U
7440-41-7	Beryllium, Dissolved	0.31	2.0	2.0	U
7440-43-9	Cadmium, Dissolved	0.062	0.20	0.20	U
7440-47-3	Chromium, Dissolved	0.31	2.0	0.537	J
7440-48-4	Cobalt, Dissolved	0.096	1.0	1.0	U
7440-50-8	Copper, Dissolved	0.33	1.0	1.0	U
7439-92-1	Lead, Dissolved	0.33	1.0	1.0	U
7439-96-5	Manganese, Dissolved	0.43	3.0	3.0	U
7440-02-0	Nickel, Dissolved	0.28	2.0	2.0	U
7782-49-2	Selenium, Dissolved	0.92	3.0	3.0	U
7440-22-4	Silver, Dissolved	0.12	0.40	0.40	U
7440-28-0	Thallium, Dissolved	0.17	1.0	1.0	U
7440-62-2	Vanadium, Dissolved	0.83	3.0	3.0	U
7440-66-6	Zinc, Dissolved	0.84	10	9.25	J

Cr = 2.685
Zn = 46.25

01423

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 7082414

SDG: 36440-39
Project: RFAAP SWMU 40
Instrument ID: 114
Calibration: 7H27002

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
7082414-ICB1	Antimony	0.160	0.60	0.089	ug/L	J	08/24/07 10:49
	Arsenic	-0.0420	0.60	0.15	ug/L	U	08/24/07 10:49
	Barium	-0.00306	0.40	0.10	ug/L	U	08/24/07 10:49
	Beryllium	0.00733	0.40	0.061	ug/L	U	08/24/07 10:49
	Cadmium	-0.000689	0.040	0.012	ug/L	U	08/24/07 10:49
	Chromium	-0.0848	0.40	0.061	ug/L	J	08/24/07 10:49
	Cobalt	0.000441	0.20	0.019	ug/L	U	08/24/07 10:49
	Copper	-0.0336	0.20	0.066	ug/L	U	08/24/07 10:49
	Lead	-0.00640	0.20	0.065	ug/L	U	08/24/07 10:49
	Manganese	-0.00559	0.60	0.086	ug/L	U	08/24/07 10:49
	Nickel	-0.0123	0.40	0.056	ug/L	U	08/24/07 10:49
	Selenium	-0.00433	0.60	0.18	ug/L	U	08/24/07 10:49
	Silver	0.000470	0.080	0.024	ug/L	U	08/24/07 10:49
	Thallium	-0.00152	0.20	0.034	ug/L	U	08/24/07 10:49
	Vanadium	-0.0473	0.60	0.17	ug/L	U	08/24/07 10:49
	Zinc	-0.135	2.0	0.17	ug/L	U	08/24/07 10:49
7082414-CCB1	Antimony	0.120	0.60	0.089	ug/L	J	08/24/07 11:17
	Arsenic	-0.0425	0.60	0.15	ug/L	U	08/24/07 11:17
	Barium	-0.00575	0.40	0.10	ug/L	U	08/24/07 11:17
	Beryllium	-0.0138	0.40	0.061	ug/L	U	08/24/07 11:17
	Cadmium	-0.00238	0.040	0.012	ug/L	U	08/24/07 11:17
	Chromium	-0.116	0.40	0.061	ug/L	J	08/24/07 11:17
	Cobalt	0.00197	0.20	0.019	ug/L	U	08/24/07 11:17
	Copper	-0.0186	0.20	0.066	ug/L	U	08/24/07 11:17
	Lead	-0.00771	0.20	0.065	ug/L	U	08/24/07 11:17
	Manganese	-0.00506	0.60	0.086	ug/L	U	08/24/07 11:17
	Nickel	-0.0120	0.40	0.056	ug/L	U	08/24/07 11:17
	Selenium	0.251	0.60	0.18	ug/L	J	08/24/07 11:17
	Silver	0.00116	0.080	0.024	ug/L	U	08/24/07 11:17
	Thallium	-0.00195	0.20	0.034	ug/L	U	08/24/07 11:17
	Vanadium	-0.0620	0.60	0.17	ug/L	U	08/24/07 11:17
	Zinc	-0.153	2.0	0.17	ug/L	U	08/24/07 11:17
7082414-CCB2	Antimony	0.0987	0.60	0.089	ug/L	J	08/24/07 12:41

01406

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-39
Client: URS Corporation
Project: RFAAP SWMU 40
Sequence: 7082414
Instrument ID: 114
Calibration: 7H27002

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
7082414-CCB2	Arsenic	-0.0561	0.60	0.15	ug/L	U	08/24/07 12:41
	Barium	-0.00336	0.40	0.10	ug/L	U	08/24/07 12:41
	Beryllium	-0.0130	0.40	0.061	ug/L	U	08/24/07 12:41
	Cadmium	-0.00472	0.040	0.012	ug/L	U	08/24/07 12:41
	Chromium	-0.0341	0.40	0.061	ug/L	U	08/24/07 12:41
	Cobalt	0.00100	0.20	0.019	ug/L	U	08/24/07 12:41
	Copper	-0.0166	0.20	0.066	ug/L	U	08/24/07 12:41
	Lead	-0.00752	0.20	0.065	ug/L	U	08/24/07 12:41
	Manganese	-0.00504	0.60	0.086	ug/L	U	08/24/07 12:41
	Nickel	-0.0179	0.40	0.056	ug/L	U	08/24/07 12:41
	Selenium	-0.0302	0.60	0.18	ug/L	U	08/24/07 12:41
	Silver	0.000420	0.080	0.024	ug/L	U	08/24/07 12:41
	Thallium	-0.00357	0.20	0.034	ug/L	U	08/24/07 12:41
	Vanadium	-0.0142	0.60	0.17	ug/L	U	08/24/07 12:41
	Zinc	-0.101	2.0	0.17	ug/L	U	08/24/07 12:41
7082414-CCB3	Antimony	0.101	0.60	0.089	ug/L	J	08/24/07 13:49
	Arsenic	0.0121	0.60	0.15	ug/L	U	08/24/07 13:49
	Barium	-0.00465	0.40	0.10	ug/L	U	08/24/07 13:49
	Beryllium	0.00492	0.40	0.061	ug/L	U	08/24/07 13:49
	Cadmium	-0.00214	0.040	0.012	ug/L	U	08/24/07 13:49
	Chromium	0.120	0.40	0.061	ug/L	J	08/24/07 13:49
	Cobalt	0.00128	0.20	0.019	ug/L	U	08/24/07 13:49
	Copper	-0.0182	0.20	0.066	ug/L	U	08/24/07 13:49
	Lead	-0.00836	0.20	0.065	ug/L	U	08/24/07 13:49
	Manganese	-0.00527	0.60	0.086	ug/L	U	08/24/07 13:49
	Nickel	-0.0139	0.40	0.056	ug/L	U	08/24/07 13:49
	Selenium	-0.0776	0.60	0.18	ug/L	U	08/24/07 13:49
	Silver	0.000558	0.080	0.024	ug/L	U	08/24/07 13:49
	Thallium	-0.00368	0.20	0.034	ug/L	U	08/24/07 13:49
	Vanadium	0.0404	0.60	0.17	ug/L	U	08/24/07 13:49
	Zinc	-0.128	2.0	0.17	ug/L	U	08/24/07 13:49
0709644-BLK1	Antimony, Total	3.0	3.0	0.44	ug/L	U	08/24/07 14:18
	Arsenic, Total	3.0	3.0	0.74	ug/L	U	08/24/07 14:18

01407

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 7082414

SDG: 36440-39
Project: RFAAP SWMU 40
Instrument ID: 114
Calibration: 7H27002

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
0709644-BLK1	Barium, Total	2.0	2.0	0.52	ug/L	U	08/24/07 14:18
	Beryllium, Total	2.0	2.0	0.31	ug/L	U	08/24/07 14:18
	Cadmium, Total	0.20	0.20	0.062	ug/L	U	08/24/07 14:18
	Chromium, Total	2.0	2.0	0.31	ug/L	U	08/24/07 14:18
	Cobalt, Total	1.0	1.0	0.096	ug/L	U	08/24/07 14:18
	Copper, Total	1.0	1.0	0.33	ug/L	U	08/24/07 14:18
	Lead, Total	1.0	1.0	0.33	ug/L	U	08/24/07 14:18
	Manganese, Total	3.0	3.0	0.43	ug/L	U	08/24/07 14:18
	Nickel, Total	2.0	2.0	0.28	ug/L	U	08/24/07 14:18
	Selenium, Total	3.0	3.0	0.92	ug/L	U	08/24/07 14:18
	Silver, Total	0.40	0.40	0.12	ug/L	U	08/24/07 14:18
	Thallium, Total	1.0	1.0	0.17	ug/L	U	08/24/07 14:18
	Vanadium, Total	3.0	3.0	0.83	ug/L	U	08/24/07 14:18
	Zinc, Total	10	10	0.84	ug/L	U	08/24/07 14:18
7082414-CCB4	Antimony	0.105	0.60	0.089	ug/L	J	08/24/07 15:04
	Arsenic	0.0614	0.60	0.15	ug/L	U	08/24/07 15:04
	Barium	-0.00363	0.40	0.10	ug/L	U	08/24/07 15:04
	Beryllium	-0.00367	0.40	0.061	ug/L	U	08/24/07 15:04
	Cadmium	-0.00750	0.040	0.012	ug/L	U	08/24/07 15:04
	Chromium	0.0621	0.40	0.061	ug/L	J	08/24/07 15:04
	Cobalt	0.00196	0.20	0.019	ug/L	U	08/24/07 15:04
	Copper	-0.0308	0.20	0.066	ug/L	U	08/24/07 15:04
	Lead	-0.00955	0.20	0.065	ug/L	U	08/24/07 15:04
	Manganese	0.00246	0.60	0.086	ug/L	U	08/24/07 15:04
	Nickel	-0.0155	0.40	0.056	ug/L	U	08/24/07 15:04
	Selenium	0.293	0.60	0.18	ug/L	J	08/24/07 15:04
	Silver	0.00102	0.080	0.024	ug/L	U	08/24/07 15:04
	Thallium	-0.00458	0.20	0.034	ug/L	U	08/24/07 15:04
	Vanadium	0.000664	0.60	0.17	ug/L	U	08/24/07 15:04
	Zinc	-0.143	2.0	0.17	ug/L	U	08/24/07 15:04
7082414-CCB5	Antimony	0.125	0.60	0.089	ug/L	J	08/24/07 16:13
	Arsenic	0.0102	0.60	0.15	ug/L	U	08/24/07 16:13
	Barium	-0.00455	0.40	0.10	ug/L	U	08/24/07 16:13

01408

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-39
Client: URS Corporation
Project: RFAAP SWMU 40
Sequence: 7082414
Instrument ID: 114
Calibration: 7H27002

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
7082414-ICB1	Antimony	0.160	0.60	0.089	ug/L	J	08/24/07 10:49
	Arsenic	-0.0420	0.60	0.15	ug/L	U	08/24/07 10:49
	Barium	-0.00306	0.40	0.10	ug/L	U	08/24/07 10:49
	Beryllium	0.00733	0.40	0.061	ug/L	U	08/24/07 10:49
	Cadmium	-0.000689	0.040	0.012	ug/L	U	08/24/07 10:49
	Chromium	-0.0848	0.40	0.061	ug/L	J	08/24/07 10:49
	Cobalt	0.000441	0.20	0.019	ug/L	U	08/24/07 10:49
	Copper	-0.0336	0.20	0.066	ug/L	U	08/24/07 10:49
	Lead	-0.00640	0.20	0.065	ug/L	U	08/24/07 10:49
	Manganese	-0.00559	0.60	0.086	ug/L	U	08/24/07 10:49
	Nickel	-0.0123	0.40	0.056	ug/L	U	08/24/07 10:49
	Selenium	-0.00433	0.60	0.18	ug/L	U	08/24/07 10:49
	Silver	0.000470	0.080	0.024	ug/L	U	08/24/07 10:49
	Thallium	-0.00152	0.20	0.034	ug/L	U	08/24/07 10:49
	Vanadium	-0.0473	0.60	0.17	ug/L	U	08/24/07 10:49
	Zinc	-0.135	2.0	0.17	ug/L	U	08/24/07 10:49
7082414-CCB1	Antimony	0.120	0.60	0.089	ug/L	J	08/24/07 11:17
	Arsenic	-0.0425	0.60	0.15	ug/L	U	08/24/07 11:17
	Barium	-0.00575	0.40	0.10	ug/L	U	08/24/07 11:17
	Beryllium	-0.0138	0.40	0.061	ug/L	U	08/24/07 11:17
	Cadmium	-0.00238	0.040	0.012	ug/L	U	08/24/07 11:17
	Chromium	-0.116	0.40	0.061	ug/L	J	08/24/07 11:17
	Cobalt	0.00197	0.20	0.019	ug/L	U	08/24/07 11:17
	Copper	-0.0186	0.20	0.066	ug/L	U	08/24/07 11:17
	Lead	-0.00771	0.20	0.065	ug/L	U	08/24/07 11:17
	Manganese	-0.00506	0.60	0.086	ug/L	U	08/24/07 11:17
	Nickel	-0.0120	0.40	0.056	ug/L	U	08/24/07 11:17
	Selenium	0.251	0.60	0.18	ug/L	J	08/24/07 11:17
	Silver	0.00116	0.080	0.024	ug/L	U	08/24/07 11:17
	Thallium	-0.00195	0.20	0.034	ug/L	U	08/24/07 11:17
	Vanadium	-0.0620	0.60	0.17	ug/L	U	08/24/07 11:17
	Zinc	-0.153	2.0	0.17	ug/L	U	08/24/07 11:17
7082414-CCB2	Antimony	0.0987	0.60	0.089	ug/L	J	08/24/07 12:41

1410

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-39
Client: URS Corporation
Project: RFAAP SWMU 40
Sequence: 7082414
Instrument ID: 114
Calibration: 7H27002

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
7082414-CCB2	Arsenic	-0.0561	0.60	0.15	ug/L	U	08/24/07 12:41
	Barium	-0.00336	0.40	0.10	ug/L	U	08/24/07 12:41
	Beryllium	-0.0130	0.40	0.061	ug/L	U	08/24/07 12:41
	Cadmium	-0.00472	0.040	0.012	ug/L	U	08/24/07 12:41
	Chromium	-0.0341	0.40	0.061	ug/L	U	08/24/07 12:41
	Cobalt	0.00100	0.20	0.019	ug/L	U	08/24/07 12:41
	Copper	-0.0166	0.20	0.066	ug/L	U	08/24/07 12:41
	Lead	-0.00752	0.20	0.065	ug/L	U	08/24/07 12:41
	Manganese	-0.00504	0.60	0.086	ug/L	U	08/24/07 12:41
	Nickel	-0.0179	0.40	0.056	ug/L	U	08/24/07 12:41
	Selenium	-0.0302	0.60	0.18	ug/L	U	08/24/07 12:41
	Silver	0.000420	0.080	0.024	ug/L	U	08/24/07 12:41
	Thallium	-0.00357	0.20	0.034	ug/L	U	08/24/07 12:41
	Vanadium	-0.0142	0.60	0.17	ug/L	U	08/24/07 12:41
	Zinc	-0.101	2.0	0.17	ug/L	U	08/24/07 12:41
7082414-CCB3	Antimony	0.101	0.60	0.089	ug/L	J	08/24/07 13:49
	Arsenic	0.0121	0.60	0.15	ug/L	U	08/24/07 13:49
	Barium	-0.00465	0.40	0.10	ug/L	U	08/24/07 13:49
	Beryllium	0.00492	0.40	0.061	ug/L	U	08/24/07 13:49
	Cadmium	-0.00214	0.040	0.012	ug/L	U	08/24/07 13:49
	Chromium	0.120	0.40	0.061	ug/L	J	08/24/07 13:49
	Cobalt	0.00128	0.20	0.019	ug/L	U	08/24/07 13:49
	Copper	-0.0182	0.20	0.066	ug/L	U	08/24/07 13:49
	Lead	-0.00836	0.20	0.065	ug/L	U	08/24/07 13:49
	Manganese	-0.00527	0.60	0.086	ug/L	U	08/24/07 13:49
	Nickel	-0.0139	0.40	0.056	ug/L	U	08/24/07 13:49
	Selenium	-0.0776	0.60	0.18	ug/L	U	08/24/07 13:49
	Silver	0.000558	0.080	0.024	ug/L	U	08/24/07 13:49
	Thallium	-0.00368	0.20	0.034	ug/L	U	08/24/07 13:49
	Vanadium	0.0404	0.60	0.17	ug/L	U	08/24/07 13:49
	Zinc	-0.128	2.0	0.17	ug/L	U	08/24/07 13:49
7082414-CCB4	Antimony	0.105	0.60	0.089	ug/L	J	08/24/07 15:04
	Arsenic	0.0614	0.60	0.15	ug/L	U	08/24/07 15:04

01411

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 7082414

SDG: 36440-39
Project: RFAAP SWMU 40
Instrument ID: 114
Calibration: 7H27002

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
7082414-CCB4	Barium	-0.00363	0.40	0.10	ug/L	U	08/24/07 15:04
	Beryllium	-0.00367	0.40	0.061	ug/L	U	08/24/07 15:04
	Cadmium	-0.00750	0.040	0.012	ug/L	U	08/24/07 15:04
	Chromium	0.0621	0.40	0.061	ug/L	J	08/24/07 15:04
	Cobalt	0.00196	0.20	0.019	ug/L	U	08/24/07 15:04
	Copper	-0.0308	0.20	0.066	ug/L	U	08/24/07 15:04
	Lead	-0.00955	0.20	0.065	ug/L	U	08/24/07 15:04
	Manganese	0.00246	0.60	0.086	ug/L	U	08/24/07 15:04
	Nickel	-0.0155	0.40	0.056	ug/L	U	08/24/07 15:04
	Selenium	0.293	0.60	0.18	ug/L	J	08/24/07 15:04
	Silver	0.00102	0.080	0.024	ug/L	U	08/24/07 15:04
	Thallium	-0.00458	0.20	0.034	ug/L	U	08/24/07 15:04
	Vanadium	0.000664	0.60	0.17	ug/L	U	08/24/07 15:04
	Zinc	-0.143	2.0	0.17	ug/L	U	08/24/07 15:04
0709686-BLK1	Antimony, Dissolved	3.0	3.0	0.44	ug/L	U	08/24/07 15:50
	Arsenic, Dissolved	3.0	3.0	0.74	ug/L	U	08/24/07 15:50
	Barium, Dissolved	2.0	2.0	0.52	ug/L	U	08/24/07 15:50
	Beryllium, Dissolved	2.0	2.0	0.31	ug/L	U	08/24/07 15:50
	Cadmium, Dissolved	0.20	0.20	0.062	ug/L	U	08/24/07 15:50
	Chromium, Dissolved	0.537	2.0	0.31	ug/L	J	08/24/07 15:50
	Cobalt, Dissolved	1.0	1.0	0.096	ug/L	U	08/24/07 15:50
	Copper, Dissolved	1.0	1.0	0.33	ug/L	U	08/24/07 15:50
	Lead, Dissolved	1.0	1.0	0.33	ug/L	U	08/24/07 15:50
	Manganese, Dissolved	3.0	3.0	0.43	ug/L	U	08/24/07 15:50
	Nickel, Dissolved	2.0	2.0	0.28	ug/L	U	08/24/07 15:50
	Selenium, Dissolved	3.0	3.0	0.92	ug/L	U	08/24/07 15:50
	Silver, Dissolved	0.40	0.40	0.12	ug/L	U	08/24/07 15:50
	Thallium, Dissolved	1.0	1.0	0.17	ug/L	U	08/24/07 15:50
	Vanadium, Dissolved	3.0	3.0	0.83	ug/L	U	08/24/07 15:50
	Zinc, Dissolved	9.25	10	0.84	ug/L	J	08/24/07 15:50
7082414-CCB5	Antimony	0.125	0.60	0.089	ug/L	J	08/24/07 16:13
	Arsenic	0.0102	0.60	0.15	ug/L	U	08/24/07 16:13
	Barium	-0.00455	0.40	0.10	ug/L	U	08/24/07 16:13

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 7082732

SDG: 36440-39
Project: RFAAP SWMU 40
Instrument ID: 114
Calibration: 7H28004

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
7082732-ICB1	Chromium	-0.00218	0.40	0.061	ug/L	U	08/27/07 17:10
7082732-CCB1	Chromium	-0.0669	0.40	0.061	ug/L	J	08/27/07 17:32
7082732-CCB2	Chromium	0.112	0.40	0.061	ug/L	J	08/27/07 17:47

* Values outside of QC limits

Quality Control Results – ICP Metals

Calibration

All instrument calibrations and continuing calibrations were method-compliant. Note: instrument reports for ICP include the listing of initial calibration correlation coefficients and internal standard recoveries; those values may either be imbedded with raw data from each run or included as a summary (also within the instrument printout).

Note: TriMatrix interprets the QSM requirement for a "low-level calibration check standard" as one pertaining to a one-point initial calibration. Given that a multi-point initial calibration was performed, the specification for a low-level calibration check either does not apply or has been satisfied since the lowest calibration standard is equivalent in concentration to the reporting limit.

Method Blanks

No target analytes were detected at a concentration greater than one-half the RL.

Internal Standard Response

Internal standard responses for all standards, samples, and quality control samples were method-compliant.

Laboratory Control Samples

Laboratory Control Samples were fortified with all target analytes. All recoveries were in control.

Matrix Spikes

Sample 40MW5 was fortified with all target analytes. All recoveries and RPDs were in control. The recoveries for Total Calcium and Dissolved Calcium in the MS were less than the lower control limit but not qualified; see Narrative Attachment 2.

Serial Dilutions and Post-Digestion Spikes

Serial dilution (SD) and post-digestion spike (PDS) analysis was performed on the sample employed for MS/MSD analysis; all values were in control.

Sample Results

Please see Section H.

Corrective Action

No corrective actions were deemed necessary.

Statements of Data Qualification

See Narrative Attachment 2.

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Individual sample results relate only to the sample tested.

Quality Control Results – ICP/MS Metals

Calibration

All instrument calibrations and continuing calibrations were method-compliant. Note: instrument reports for ICP/MS include the listing of initial calibration correlation coefficients and internal standard recoveries; those values may either be imbedded with raw data from each run or included as a summary (also within the instrument printout).

Method Blanks

No analytes were detected except for Zinc, at a concentration less than the RL, in the method blank associated with Dissolved Zinc. Samples for both Total and Dissolved Metals are digested, as sample types (i.e., total versus dissolved), separately from one another.

Note: Zinc is considered by TriMatrix to be a common laboratory contaminant.

Internal Standard Response

Internal standard responses for all standards, samples, and quality control samples were method-compliant.

Laboratory Control Samples

Laboratory Control Samples were spiked with all target analytes. All recoveries were in control.

Matrix Spikes

Sample 40MW5 for both Total and Dissolved Metals was fortified with all target analytes. All recoveries and RPDs were in control.

Serial Dilutions and Post-Digestion Spikes

Serial dilution (SD) and post-digestion spike (PDS) analysis for both Total and Dissolved Metals was performed on the sample employed for MS/MSD analysis; all values were in control.

Sample Results

Please see Section H.

Corrective Action

No corrective actions were deemed necessary.

Statements of Data Qualification

See Narrative Attachment 2.

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Quality Control Results – CVAA Hg

Calibration

All instrument calibrations and continuing calibrations were method-compliant.

Method Blank

Mercury was not detected.

Laboratory Control Samples

The Laboratory Control Sample recoveries were in control.

Matrix Spikes

Sample 40MW5 was fortified with Mercury. Both recoveries and the RPD were in control.

Serial Dilution

Serial dilution analysis was not necessary.

Sample Results

Please see Section H.

Corrective Action

No corrective actions were deemed necessary.

Statements of Data Qualification

No statements were generated.

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Data Review and Approval

All data was reviewed and approved by the group supervisor/manager prior to further review by the project chemist.

Data Deliverables

The data deliverables, both hardcopy and electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD has been issued separate from this hardcopy report.

Walt Roudebush, Project Chemist

9/19/07
Date

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Individual sample results relate only to the sample tested.

Sample Receipt and Log-in

There were two receipt events.

Receipt Event One

On August 15, 2007 at 09:00 hrs, three sample coolers containing multiple water samples were received at TriMatrix via FedEx (the carrier). The coolers had been shipped from the Site on August 14.

The external custody seal affixed to each cooler was intact. The samples were received on ice and in good condition. The receipt temperature of the interior of each cooler was measured via a 'temperature blank' shipped in it; the measured temperatures, in °C, were 2.1, 1.6, and 2.2.

Shipping documents included three field chains-of-custody form (COC) and associated carrier air bills. Three trip blanks for volatiles analysis were received but not listed on the COCs. The Client was contacted and TriMatrix added them to each COC and logged them in for analysis.

Samples were assigned to Work Order 0708362 and SDG 36440-39.

Receipt Event Two

On August 16, 2007 at 08:45 hrs, four sample coolers containing multiple water samples were received at TriMatrix via FedEx (the carrier). The coolers had been shipped from the Site on August 15.

The external custody seal affixed to each cooler was intact. The samples were received on ice and in good condition. The receipt temperature of the interior of each cooler was measured via a 'temperature blank' shipped in it; the measured temperatures, in °C, were 2.0, 1.4, 1.9, and 1.2.

Shipping documents included three field chains-of-custody form (COC) and associated carrier air bills. Three trip blanks for volatiles analysis were received and listed on the COCs but no collection dates and times were listed on the COCs. TriMatrix added dates and times corresponding to the associated sample collection dates to each COC.

Sample 40MW5 was designated by the Client for MS/MSD analysis.

Samples were assigned to Work Order 0708363 and SDG 36440-39.

Both Events

Copies of all referenced receipt and custody documents are provided in Section A of this data package. Correspondence regarding completed sample log-in activities will be found in Attachment 1 of this narrative.

Provision of Sample Receipt Information to Client

A copy of the COCs and receipt checklist were transmitted to the Client within one day of sample receipt. The Client did not request any modification(s) to the analyses, as listed on the COC.

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Post-Receipt Sample Custody

Custody of the sample during sample preparation (if applicable) and analysis was assigned to individual analysts. Copies of completed 'internal chain of custody' forms are included in Section A.

Variances

Data Qualifier Flags

Data qualifier flags other than those listed in the DoD QSM were employed or the definition of an existing flag was modified.

J – Estimated: the analyte was detected at a concentration greater than the limit of detection (i.e., MDL) but less than the reporting limit (i.e., MRL).

B – Blank contamination: The analyte was detected above one-half the reporting limit in an associated method blank. The same analyte in the sample was detected at less than five times the method blank concentration. (If a common laboratory contaminant is present in the method blank at a concentration greater than one-half the reporting limit but less than or equal to that reporting limit, any associated sample results are flagged but corrective action is not necessarily taken. A text qualifier is also associated with such a result.)

E – Exceeds calibration range: The analyte response exceeded the calibrated range of the instrument. (With the exception of metals for which only the final non-qualified result is reported, both the initial E-qualified result and final non-qualified result from reanalysis-at-dilution are reported.)

Text Qualifier

A LIMS-generated text qualifier is substituted for many instances in which the DoD QSM "Q" flag would otherwise apply. The text qualifiers are listed in a summary format by parameter with applicable samples identified.

Methods 6010B and 6020A

The acceptance criterion of < 2 x RL is substituted for < 2 x MDL for interference check solution ICS-A.

Analytical Methods

Sample preparation and analytical methods that were employed are per the SOW.

Method Detection Limits, Target Analytes, and Reporting Limits

All method detection limits (MDL) for analytes in this report are compliant with the DoD QSM specification that each reporting limit (RL) employed is to be at least three times the MDL. In addition, no RL is less than the equivalent concentration of the lowest instrument calibration standard. The target analyte list was specified by the Client. Proposed RLs were submitted by TriMatrix to the Client prior to the receipt of any samples.

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Project-specific Analytes of Concern

No project-specific analytes of concern were identified in the SOW, however, it is assumed that Method 8330 and 8332 target analytes are of concern.

Quality Control Limits

Quality control limits specified in the DoD QSM were employed. For cases in which the analyte is not listed in the QSM, internal laboratory control limits were used.

Hold Times

All samples were extracted/digested (where applicable) and analyzed within hold time with the exception of the MS and MSD for sample 40MW5 for one SVOC target analyte. A second MS/MSD fortified with that target analyte was extracted within twice the hold time. See the QC section for Semivolatiles for further detail. The Client was advised at the time of discovery.

Technical Issues

There were no general technical issues. Any issues unique to a particular parameter will be discussed in the QC section for it.

Sample Result Reporting Convention

Sample results are reported as RL 'U' (e.g., 0.001 U) if the target analyte was not detected above the MDL. If a sample for an organic parameter is reanalyzed and also reported, the second analysis includes the suffix 'REn' where n = the first, second, etc. reanalysis. If a sample is reanalyzed for confirmation purposes, is confirmed, and also reported, the second analysis includes the suffix 'RE1'. If the confirmation was not performed simultaneously, the second set of sample results is reported on a second Form 1 since that confirmation analysis did not occur at the same time and/or date.

Data Qualifier Designation

If applicable, a sample result is qualified with:

- a "U" flag if the analyte was not detected at a concentration greater than the MDL,
- a "B", "J", and/or an "E" flag as defined in the preceding Variance section,
- a LIMS-generated statement of qualification. Qualifying statements, if any, will be found in Attachment 2 to this narrative.

QC Batch and Analytical Batch Designation

A QC Batch is a seven digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation); it is limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.).

An Analytical Batch (or Sequence) is a seven digit number that associates all samples analyzed as a set under one analytical sequence.

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Individual sample results relate only to the sample tested.

STATEMENT OF DATA QUALIFICATIONS

Total Metals by EPA 6000/7000 Series Methods

Qualification: The % difference between the values of the isotopes monitored for this analyte exceeded 25%; the lower of the two results has been reported.

Analysis: USEPA-6020A

Sample/Analyte:		
0708362-01	17MW3	Nickel
0708363-01	40MW6	Nickel
0708363-03	40MW5	Nickel
0708363-05	DUP-1	Chromium
0708363-05	DUP-1	Nickel

Qualification: This analyte was not present in this sample at a concentration greater than 50 times the MDL, therefore serial dilution is not required.

Analysis: USEPA-6010B

Sample/Analyte: 0708363-03 40MW5 Potassium

Qualification: This analyte was not present in this sample at a concentration greater than 100 times the MDL, therefore serial dilution is not required.

Analysis: USEPA-6020A

Sample/Analyte: 0708363-03 40MW5 Chromium

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was greater than or equal to 4 times the spiked amount; the non-spiked sample result is not qualified.

Analysis: USEPA-6010B

Sample/Analyte: 0708363-03 40MW5 Calcium

STATEMENT OF DATA QUALIFICATIONS

Dissolved Metals by EPA 6000/7000 Series Methods

Qualification: The analyte concentration in the MB for this common lab contaminant was greater than 1/2 the RL, but less than or equal to the RL. All associated samples had results less than the RL. No qualification is required.

Analysis: USEPA-6020A

0709686-BLK1 Zinc

Qualification: The % difference between the values of the isotopes monitored for this analyte exceeded 25%; the lower of the two results has been reported.

Analysis: USEPA-6020A

Sample/Analyte: 0708362-01 17MW3 Nickel

0708363-03 40MW5 Nickel

Qualification: This analyte was not present in this sample at a concentration greater than 50 times the MDL, therefore serial dilution is not required.

Analysis: USEPA-6010B

Sample/Analyte: 0708363-03 40MW5 Potassium

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was greater than or equal to 4 times the spiked amount; the non-spiked sample result is not qualified.

Analysis: USEPA-6010B

Sample/Analyte: 0708363-03 40MW5 Calcium

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 120298 (1)

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For Lab Use Only

Cart: Le
VOA Rack/Tray: 6760
Receipt Log No.: 311
Project Chemist: WSR
Laboratory Project No.: E07H323

Client Name	Project Name
URS/RFAAP	SWMU 40 GW Investigation
Address: 5540 Falmouth St Suite 201, Richmond VA 23230	Client Project No./P.O. No.: 21354850.10001
Phone: 804-965-9000	Invoice No. ☒ Client ☐ Other (comments)
Fax: 804-965-9746	Contact/Report To: Tina Devine

Analyses Requested

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	VOC 8260B	SVOC 8270C	Chlorinated Pesticides 8081A	PCBs 8082	8330 8332	Metals 6000/7000	Metals 6020/7000	Total	Sample Comments
			Container Type (corresponds to Container Packing List)							1	2	2	2	2	6	15		
			Number of Containers Submitted															
01	GW	-01	1 17MW3	TM1420	8-13-07	1805		✓	GW	3	2	2	2	2	1	1	13	ph 1-#1 p
02	GW	-02	2 TRIP BLANK	TM 1420	8-13-07	1800				1								Added by TriMatrix per URS 8/15/07 WR
			3															
			4															
			5															
			6															
			7															
			8															
			9															
			10															

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Sampled By (print): Jim Carter
Sampler's Signature: Jim Carter
Company: URS Corp.

How Shipped? Hand Carrier FedEx
Tracking No.

Comments: * Sample container labels incorrectly labeled for July instead of August!

1. Relinquished By	Date	Time

2. Relinquished By	Date	Time

3. Relinquished By	Date	Time

1. Received By	Date	Time

2. Received By	Date	Time

3. Received For Lab By	Date	Time
Kim Ziegler	8-15-07	9:00

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Chain of Custody Record

COC No. 118667

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For Lab Use Only

Cart: 6
VOA Rack/Tray: 676W
Receipt Log No.: 341
Project Chemist: WSR
Laboratory Project No.: E-07083G2

Client Name: URS/RFAAP
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone: 804-965-9000
Fax: 804-965-9764

Project Name: SWMU 40 GW Investigation
Client Project No./P.O. No.: 21354830.10001
Invoice No.: ☒ Client ☐ Other (comments)
Contact/Report To: Tina DeVine

Analyses Requested

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
1	01	WG	-03	40 MW 3	TM 1776	8/14/07	1300		X	GW	B 8 2 2 2 1 4	13	#1 Fld, 1
2	02	WQ	-04	TRIP BLANK	TM 1776	8/14/07	1300				✓		Added by TriMatrix per URS 8/15/07 WR
3													
4													
5													
6													
7													
8													
9													
10													

Container Type (corresponds to Container Packing List): D A A A A B B

Code	Container Type
D	VOC 8260B
A	SVOC 8270C
A	8051A
A	PCBs 8082
A	6330, 6332 Metals 6000/7000
B	Metals 6000/7000
B	

PRESERVATIVES

A	NONE pH~7
B	HNO_3 pH<2
C	H_2SO_4 pH<2
D	1+1 HCl pH<2
E	NaOH pH>12
F	ZnAc/NaOH pH>9
G	MeOH
H	Other (note below)

Sampled By (print): Chris Franke
Sampler's Signature:
Company: URS Corp

How Shipped? Hand Carrier Fed Ex
Tracking No.

Comments: ** sample container labels incorrectly labeled for July instead of August!

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
						Kim Ziegler	8-15-07	9:00

Fed Ex

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 120299

(3)

Page 1 of 1

For Lab Use Only

Cart: Le
VOA Rack/Tray: 6760
Receipt Log No.: 3-11
Project Chemist: CNJR
Laboratory Project No.: E-070836-2

Client Name: URS / RFAAP
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone: 804-965-9000
Fax: 804-965-9764

Project Name: SWMU 40 GW Investigation
Client Project No./P.O. No.: 21354880.10001
Invoice No.: ☑ Client ☐ Other (comments)
Contact/Report To: Tina DeVine

Analyses Requested

	D	A	A	A	A	B				
	VOC 8260B	SVOC 8270C	8081A	PCB 8082	8330/8332 Nitrates	6010/7420				
Container Type (corresponds to Container Packing List)	1	2	2	2	2	2				
Number of Containers Submitted	2	2	2	2	2	1				
Total	11									

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Sample Comments
1	03	GW	-05	EQBK-1	TM1566	8/14/07	1405		X	GW	
2	02	W	-06	TRIP BLANK	TM 1566	8/14/07	1400				Added by TriMatrix for URS 8/15/07 CNJR
3											
4											
5											
6											
7											
8											
9											
10											

Sampled By (print): Chris Frankie
Sampler's Signature:
Company: URS Corp.

How Shipped? Hand Carrier: Fed Ex
Tracking No.:

Comments: * Sample container labels incorrectly labeled for July instead of August!

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
						Kim Ziegler	8/15/07	900

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Chain of Custody Record

COC No. 120300

Page 1 of 1

For Lab Use Only

Cart: 3
VOA Rack/Tray: 312 W.
Receipt Log No.: 511
Project Chemist: WSR
Laboratory Project No.: ED7083263

Client Name: URS / READAP
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone: 804-965-9000
Fax: 804-965-9764

Project Name: Skumu 40 GW Investigation
Client Project No./P.O. No.: 21354880.10001
Invoice No.: ☒ Client ☐ Other (comments)
Contact/Report To: Tina Allire

Analyses Requested

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Total	Sample Comments
01	WG	-01	1	40 MW 6	TM1441	8/14/07	1940		X	GW	13	Ph-1 #'s
02	WQ	-02	2	Trip Blank	TM1441						1	
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

Container Type (corresponds to Container Packing List)

	D	A	A	A	A	B	B				
	VOC 8260B	SVOCs 8270C	8081A	PCBs 8082	8330, 5332	Metals 6020/7000	Metals 6020/7000				
Number of Containers Submitted	3	2	2	2	2	1	1				

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

8/14/07 2000 hrs. added by TriMatrix WR

Sampled By (print): Chris Franke
Sampler's Signature:
Company: URS Corp.

How Shipped? Hand Carrier: Fed Ex
Tracking No.:

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	8/16/07	1638						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
						Kim Ziegler	8.16.07	8:45

TriMatrix Laboratories, Inc.

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Chain of Custody Record

COC No. 120301 (2)

Page 1 of 1

For Lab Use Only
Cart: 3
VOA Rack/Tray: 212W
Receipt Log No.: 5-11
Project Chemist: WSR
Laboratory Project No.: E0708363

Client Name	Project Name
IRS/RFAAP	Swmu 40 GW Investigation
Address: 5540 Falmouth St. Suite 201	Client Project No./P.O. No.: Z1354880.10001
Richmond, VA 23230	Invoice No. ☒ Client ☐ Other (comments)
Phone 804-965-9000	Contact/Report To: Tina DeVine
Fax 804-965-9764	

Analyses Requested

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted	Total	Sample Comments
										D A A A A B B			⇦ PRESERVATIVES
										VOC 8260B			A NONE pH~7
										SVOCs 8270C			B HNO_3 pH<2
										8081A			C H_2SO_4 pH<2
										PCBs 8082			D 1+1 HCl pH<2
										8330, 5332			E NaOH pH>12
										Metals 6000/7000			F ZnAc/NaOH pH>9
										Metals 6000/7000			G MeOH
													H Other (note below)
04	WG	-03	1 40MW5	TM1559	8/15/07	1215		X	GW	B	11		Pb-1 # 1p Metals bottles include ms/msd (ticked here)
02	WQ	-04	2 Trip Blank	TM1559						V	1		
			3 40MW5 ms/msD	TM1559	8/15/07	1215		X	GW	4	4		
			4 40MW5 (plus ms/msD)	TM1559	8/15/07	1215				V 4	2		
			5										
			6		8/15/07 (1200 hrs) added for Trip Blank by TriMatrix (WRC)								
			7										
			8										
			9										
			10										

Sampled By (print): Chris Frankel
Sampler's Signature: Chris Frankel
Company: WES Corp.

How Shipped? Hand Carrier: Fed Ex
Tracking No.:

Comments: ☆ VOAs from 40 MW5 ms/msD included in this cooler due to shortage of trip blanks!

1. Relinquished By	Date	Time
Chris Frankel	8/15/07	1630
1. Received By	Date	Time

2. Relinquished By	Date	Time
2. Received By	Date	Time

3. Relinquished By	Date	Time
3. Received For Lab By	Date	Time
Kim Ziegler	8/16/07	8:45

TriMatrixCOC -- COC WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

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Chain of Custody Record

COC No. 118950

(3)

Page 1 of 1

For Lab Use Only
Cart: 3
VOA Rack/Tray:
Receipt Log No.: 5-11
Project Chemist: CSR
Laboratory Project No.: E

Client Name: URS/RFAAP
Address: 5510 Falmouth St. Suite 201
Richmond, VA 23230
Phone: 804-965-9000
Fax: 804-965-9764

Project Name: SWMU 40 GW Investigation
Client Project No./P.O. No.: 21354990.10001
Invoice No.: ☒ Client ☐ Other (comments)
Contact/Report To: Tina DeLine

Analyses Requested

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Total	Sample Comments
										A A A A (SVOCs 8270C; 8081A; PCBs 8082; 8330, 5332)		
										Number of Containers Submitted		
		1	40MW5 MS/MSD	TM1412	8/15/07	1215		X	GW	8 8 2 2	10	Metals included in 40MW5 for MS/MSD.
		2										
		3										
		4										
		5										
		6										
		7										
		8										
		9										
		10										

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Sampled By (print): Chris Franke
Sampler's Signature:
Company: URS Corp.

How Shipped? Hand Carrier: Fed Ex
Tracking No.:

Comments: * Trip Blank supply not enough. VOAs from 40MW5 MS/MSD included in cooler TM1559 with 40MW5 samples!

1. Relinquished By	Date	Time
	8/15/07	1628

2. Relinquished By	Date	Time

3. Relinquished By	Date	Time

1. Received By	Date	Time

2. Received By	Date	Time

3. Received for Lab By	Date	Time
Kim Ziegler	8-16-07	9:45

TriMatrixCOC -- COC WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

TriMatrix Laboratories, Inc.

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Chain of Custody Record

COC No. 118953 (4)

Page 1 of 1

For Lab Use Only
Cart: 3
VOA Rack/Tray: 2/2 W
Receipt Log No.: 5-11
Project Chemist: LWR
Laboratory Project No.: ED7083633

Client Name: URS/RFAAP	Project Name: SWMU 40 GW Investigation
Address: 5540 Falmouth St. Suite 201	Client Project No./P.O. No.: 21354880.10001
Richmond, VA 23230	Invoice No. ☒ Client ☐ Other (comments)
Phone: 804-965-9000	Contact/Report To: Tina DeVine
Fax: 804-965-9764	

Analyses Requested

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
											1 2 2 2 2 6 15		
1	05W	E	-05	DUP-1	TM1462	8/15/07	—		X	GW	B 12 2 2 2 4 1	13	1ph-1#1p
2	02W	Q	-06	Trip Blank	TM1462	—	—				✓	1	
3													
4						8/15/07 1200 hrs.							
5						added by TriMatrix							
6													
7													
8													
9													
10													

Container Type (corresponds to Container Packing List)

Preservatives: A NONE pH~7 (1) · B HNO_3 pH<2 (5) · C H_2SO_4 pH<2 (5) · D 1+1 HCl pH<2 (5) · E NaOH pH>12 · F ZnAc/NaOH pH>9 · G MeOH · H Other (note below)

Sampled By (print): Chris Franke	How Shipped? Hand Carrier Fed Ex	Comments	
Sampler's Signature:	Tracking No.		
Company: URS Corp.	1. Relinquished By:	Date: 8/15/07	Time: 1634
	1. Received By	Date	Time
	2. Relinquished By	Date	Time
	2. Received By	Date	Time
	3. Relinquished By	Date	Time
	3. Received For Lab By: Kim Ziegler	Date: 8-16-07	Time: 8:45

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination	n	Failed Signal to noise ratio		

DATA VALIDATION REPORT - Level III Review

SDG No.: R2739188 **Fraction:** Perchlorate

Lab: Columbia Analytical Services **Project Name** Radford SWMU 40

Reviewer: RA **Date:** September 14, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The perchlorate result in sample 17MW3 exceeded the calibration range of the instrument and was flagged "E" by the laboratory. This result was flagged "J,q" by the reviewer. This sample was re-analyzed at a dilution factor of two with an acceptable result that should be used for data interpretation purposes.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Rayan

CAS ASP/CLP BATCHING FORM / LOGIN SHEET

SDG #:17MW3
SUBMISSION R2739188
CLIENT: URS Corp.
CLIENT REP: Michael Perry
PROJECT: SWMU 40 GW INVESTIGATION

BATCH COMPLETE: __yes_____
DISKETTE REQUESTED: Y_X__ N____
DATE: 8/20/07
CUSTODY SEAL: PRESENT
CHAIN OF CUSTODY: PRESENT

DATE REVISED:
DATE DUE: 9/06/07
PROTOCOL: SW846
SHIPPING No.:

CAS JOB #	CLIENT/EPA ID	MATRIX	REQUESTED PARAMETERS	DATE SAMPLED	DATE RECEIVED	pH (SOLIDS)	% SOLIDS	REMARKS SAMPLE CONDITION
1028053	17MW3	WATER	Perchlorate by 6850	8/13/2007	8/16/2007			
1028054	40MW3	WATER	Perchlorate by 6850	8/14/2007	8/16/2007			
1028055	40MW6	WATER	Perchlorate by 6850	8/14/2007	8/16/2007			
1028056	40MW5 + QC	WATER	Perchlorate by 6850	8/15/2007	8/16/2007			
1028057	DUP-1	WATER	Perchlorate by 6850	8/15/2007	8/16/2007			
1028058	EQBK-1	WATER	Perchlorate by 6850	8/14/2007	8/16/2007			

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 09/06/07

URS Corp.
Project Reference: SWMU 40 GW INVESTIGATION
Client Sample ID : 17MW3

Date Sampled : 08/13/07 18:05 **Order #:** 1028053 **Sample Matrix:** WATER
Date Received: 08/16/07 **Submission #:** R2739188 **Analytical Run** 149089

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 08/20/07				
DATE ANALYZED : 08/20/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	~~5.4 E J,q UG/L~~ D e	

USR D f=2
RA
9/12/07

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 09/06/07

URS Corp.
Project Reference: SWMU 40 GW INVESTIGATION
Client Sample ID : 17MW3

Date Sampled : 08/13/07 18:05 **Order #:** 1028053 **Sample Matrix:** WATER
Date Received: 08/16/07 **Submission #:** R2739188 **Analytical Run** 149089

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 08/20/07				
DATE ANALYZED : 08/21/07				
ANALYTICAL DILUTION: 2.00				
PERCHLORATE	0.080	0.20	5.2	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 09/06/07

URS Corp.
Project Reference: SWMU 40 GW INVESTIGATION
Client Sample ID : 40MW3

Date Sampled : 08/14/07 13:00 **Order #:** 1028054 **Sample Matrix:** WATER
Date Received: 08/16/07 **Submission #:** R2739188 **Analytical Run** 149089

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 08/20/07				
DATE ANALYZED : 08/20/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.52	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 09/06/07

URS Corp.
Project Reference: SWMU 40 GW INVESTIGATION
Client Sample ID : 40MW6

Date Sampled : 08/14/07 19:40 **Order #:** 1028055 **Sample Matrix:** WATER
Date Received: 08/16/07 **Submission #:** R2739188 **Analytical Run** 149089

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 08/20/07				
DATE ANALYZED : 08/20/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.52	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 09/06/07

URS Corp.
Project Reference: SWMU 40 GW INVESTIGATION
Client Sample ID : 40MW5

Date Sampled : 08/15/07 19:40 **Order #:** 1028056 **Sample Matrix:** WATER
Date Received: 08/16/07 **Submission #:** R2739188 **Analytical Run** 149089

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 08/20/07				
DATE ANALYZED : 08/20/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.64	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 09/06/07

URS Corp.
Project Reference: SWMU 40 GW INVESTIGATION
Client Sample ID : DUP-1

Date Sampled : 08/15/07 : **Order #:** 1028057 **Sample Matrix:** WATER
Date Received: 08/16/07 **Submission #:** R2739188 **Analytical Run** 149089

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 08/20/07				
DATE ANALYZED : 08/20/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.67	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 09/06/07

URS Corp.
Project Reference: SWMU 40 GW INVESTIGATION
Client Sample ID : EQBK-1

Date Sampled : 08/14/07 14:05 **Order #:** 1028058 **Sample Matrix:** WATER
Date Received: 08/16/07 **Submission #:** R2739188 **Analytical Run** 149089

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 08/20/07				
DATE ANALYZED : 08/20/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

DATA VALIDATION WORKSHEET

Perchlorate

Reviewer: RA
Date: 9/12/07
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: SWMU 40
Project Number:
Laboratory: Columbia Analytical
SDG No.: R2739188
Test Name: Perchlorate
Method No.: 6850

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample collection, preservation, shipping, and storage condition meet the project controlling documents?	✓		
	Action: No chemical preservation required.			✓
2.2	Have any technical holding times (28 days), determined from date of sampling to date of analysis, (including dilution or reanalysis) been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks prepared at the appropriate frequency? If not, note in DV report.	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the [sample]≤ 5X[associated blank].		✓	
3.3	Do any field equipment blanks blanks have positive results? If Yes, use same rules above.		✓	

Notes:

URS

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve?If no apply R flags.	✓		
4.2	Are all initial calibration correlation coefficient within the control limits (r>0.99)?If no J(+), R (-)	✓		
4.3	Was an ICV analyzed and are %RSDs < 15%? If no J(+), UJ(-)	✓		
4.4	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Are %Ds < 25%. If no, R (-), J (+).	✓		

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?(75-125% for water and soil)		✓	
5.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (i.e., 15%)?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data.			

Notes:

6.0 Laboratory Control Sample(LCS)		Yes	No	NA
6.1	Is the LCS recovery form present?	✓		
6.2	Was LCS analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Is the %R for LCS outside the QC limits(85-115% for water and soil)? If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits(i.e., 15%)? If Yes, J(+) only.		✓	

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
	For sample results > 5 x RL, use 50% RPD. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 x RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV		✓	

Notes: 40MW5 and DUP-1 PQL

Perchlorate 0.64 ug/L 0.67 ug/L 0.2 ok ✓

8.0 Laboratory Duplicates		Yes	No	NA
8.1	Was a lab duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
8.2	Are all analyte duplicate results within control limits (i.e., RPD < 15%)? If no, J(+) only.	✓		

Notes:

9.0 Internal Standards		Yes	No	NA
9.1	Are internal standard areas of every sample and blank within +/-30% of the ICV or CCV? If no, J(+), UJ(-)	✓		
	If the IS area count criteria is not met, corrective action should be taken to resolve the problem and the entire batch should			
	be re-analyzed.	✓		

10.0 Detection Limit Verification		Yes	No	NA
10.1	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
10.2	Were sample concentrations above the highest standard run at a dilution? If not, note in DV report.	✓		

Notes: Perchlorate exceeded calib range in 17MW3 → E by lab → J/q use DF=2

11.0 Data Completeness		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit 90%)	✓		
11.2	Number of samples:			
11.3	Number of target compounds in each analysis:			
11.4	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = 100%			

Notes:

CASE NARRATIVE
COMPANY: URS
PROJECT: SWMU 40
SUBMISSION #: R2739188

Samples were collected on 08/13/07 – 8/15/07 and received at CAS/Rochester on 08/16/07 in good condition at a cooler temperature of 2 °C. A Level 4 Data package has been delivered.

PERCHLORATE ANALYSIS

Six water samples were analyzed for Perchlorate by LC/MS method 6850 with DOD modifications from the DOD Perchlorate Handbook. Values detected between the MDL and PQL have been flagged with a "J" as estimated.

Sample 17MW3 was re-analyzed at a larger dilution to bring the target analyte within the calibration range of the method. Both dilutions were reported with the target analyte over range flagged with an "E".

All the initial and continuing calibration criteria were met for all analytes.

Site-specific QC was done on sample 40MW5. The recoveries were diluted out due to the level of Perchlorate detected in the sample and have been flagged with a "D". The RPD was within QC limits. The Blank Spike (LCS) and LODV spike recoveries were within QC limits.

The Laboratory Blank associated with these samples was free of contamination.

No other analytical or QC problems were encountered.

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An Employee - Owned Company

ACCREDITED IN ACCORDANCE WITH nelac

2005 SEAL OF EXCELLENCE PROGRAM

ORGANIC QUALIFIERS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds, or when the data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit and greater than the MDL. This flag is also used for DoD instead of "P" as indicated below.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search.

P - This flag is used for a pesticide/Aroclor target analyte when there is a greater than 40% (25% for CLP) difference for detected concentrations between the two GC columns. The concentration is reported on the Form I and flagged with a "P" ("J" for DoD).

Q - for DoD only – indicates a pesticide/Aroclor target is not confirmed. This flag is used when there is ≥ 100% difference for the detected concentrations between the two GC columns.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and ALL concentration values reported on that Form I are flagged with the "D" flag.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - As specified in Case Narrative.

* - This flag identifies compounds associated with a quality control parameter which exceeds laboratory limits.

CAS/Rochester Lab ID # for State Certifications

NELAP Accredited
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Illinois ID #200047
Maine ID #NY0032
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited
New Jersey ID # NY004
New York ID # 10145
New Hampshire ID # 294100 A/B
Pennsylvania ID# 68-786
Rhode Island ID # 158
West Virginia ID # 292

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CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

One Mustard St., Suite 250 • Rochester, NY 14609-0859 • (585) 288-5380 • 800-695-7222 x11 • FAX (585) 288-8475 PAGE 1 OF 1

SR #

CAS Contact

Project Name: 40MW40 GW Investigation	Project Number: 21354880
Project Manager: Tim Dekline	Report CC: client
Company/Address: 5540 Falmouth St. Suite 201, Richmond, VA 23230	
Phone #: 804-965-9000	FAX#: 804-965-9764
Sampler's Signature:	Sampler's Printed Name: Chris Franke

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	PRESERVATIVE	GC/MS VOA's ☐ 8260 ☐ 624 ☐ CLP	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ CLP	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES ☐ 8081 ☐ 608 ☐ CLP	PCB's ☐ 8082 ☐ 608 ☐ CLP	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	TCL VOC + Chloride (6850)							REMARKS/ ALTERNATE DESCRIPTION
17MW3		8/13/07	1805	GW	1									X							
40MW3		8/14/07	1300	GW	1									X							
40MW6		8/14/07	1940	GW	1									X							
40MW5		8/15/07	1215	GW	1									X							
40MW5MS/MSD		8/15/07	1215	GW	1									X							
DUP-1		8/15/07	—	GW	1									X							
EQBK-1		8/14/07	1405	GW	1									X							

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
_____ RUSH (SURCHARGES APPLY)
_____ 24 hr _____ 48 hr _____ 5 day
X STANDARD
REQUESTED FAX DATE
REQUESTED REPORT DATE

REPORT REQUIREMENTS
_____ I. Results Only
_____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
_____ III. Results + QC and Calibration Summaries
X IV. Data Validation Report with Raw Data
_____ V. Speicalized Forms / Custom Report
Edata X Yes _____ No
GIS key

INVOICE INFORMATION
PO# 21354880.10001
BILL TO: URS
R2739188
SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: 2°C CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Chris Franke	Printed Name: Amy Hentschke	Printed Name	Printed Name	Printed Name	Printed Name
Firm: URS	Firm: CAS	Firm	Firm	Firm	Firm
Date/Time: 8/15/07 1647	Date/Time: 8/16/07 925	Date/Time	Date/Time	Date/Time	Date/Time

Cooler Receipt And Preservation Check Form

Project/Client URS Submission Number _____.

Cooler received on 8/16/07 by: AWH **COURIER:** CAS UPS (FEDEX) VELOCITY CLIENT

1.	Were custody seals on outside of cooler?	(YES)	NO			
2.	Were custody papers properly filled out (ink, signed, etc.)?	(YES)	NO			
3.	Did all bottles arrive in good condition (unbroken)?	(YES)	NO			
4.	Did any VOA vials have significant air bubbles?	YES	NO	(N/A)		
5.	Were **Ice** or **Ice packs** present?	(YES)	NO			
6.	Where did the bottles originate?	(CAS/ROC,)	CLIENT			
7.	Temperature of cooler(s) upon receipt:	2°	_____	_____	_____	_____
	Is the temperature within 0° - 6° C?:	(Yes)	Yes	Yes	Yes	Yes
	If No, Explain Below	No	No	No	No	No

Date/Time Temperatures Taken: 8/16/07 9:36

Thermometer ID: 161 or (IR GUN) Reading From: Temp Blank or (Sample Bottle)

If out of Temperature, Client Approval to Run Samples _____

PC Secondary Review: MP 8/16/07

Cooler Breakdown: Date : 08/16/07 by: _____

1.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
2.	Did all bottle labels and tags agree with custody papers?	(YES)	NO
3.	Were correct containers used for the tests indicated?	(YES)	NO
4.	Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated		(N/A)

Explain any discrepancies: _____

		YES	NO	Sample I.D.	Reagent	Vol. Added	Final pH
pH	Reagent						
≥12	NaOH						
≤2	HNO_3						
≤2	H_2SO_4						
Residual Chlorine (+/-)	for TCN & Phenol						

YES = All samples OK NO = Samples were preserved at lab as listed PC OK to adjust pH _____

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2		

Other Comments:

PC Secondary Review: _____

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination	n	Failed Signal to noise ratio		

SOLID WASTE MANAGEMENT UNITS 40 (RAAP-009) AND 71 (RAAP-002) RCRA FACILITY INVESTIGATION/ CORRECTIVE MEASURES STUDY REPORT

VOLUME II

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

FINAL
APRIL 2009

CONTRACT NO.
DACA31-00-D-0011
DELIVERY ORDER NO. 0023

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